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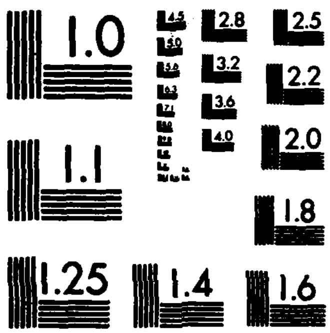

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U.S. ARMY
CORPS OF ENGINEERS
BALTIMORE DISTRICT

OPERATION, MAINTENANCE AND PERFORMANCE EVALUATION of the POTOMAC ESTUARY EXPERIMENTAL WATER TREATMENT PLANT

APPENDIX - VOLUME 2

SEPTEMBER 1980 - SEPTEMBER 1983

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JAMES M. MONTGOMERY, CONSULTING ENGINEERS, INC.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Water Resources Act of 1974 authorized the Baltimore District of the U.S. Army Corps of Engineers to investigate the use of the Potomac River Estuary as a possible supplemental water supply source for the Metropolitan Washington Area (MWA). Use of the Estuary, a source expected to be contaminated with substantial amounts of treated wastewater during a severe drought, was one of several structural and non-structural alternatives to meet the long term water supply needs of the MWA, which were evaluated in the U.S. Army Corps of Engineers' MWA Water

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Estuary Model.

20. ABSTRACT (continued)

Supply Study.

The investigation evaluated the water quality produced by a 1.0 MGD demonstration water treatment plant (EEWTP), which was located adjacent to the Estuary at the Blue Plains WPCP, Washington, D. C.

Based on certain hydrologic conditions and the results of the EPA Dynamic Estuary Model, a raw water mix of 50 percent estuary water and 50 percent nitrified Blue Plains sewage effluent was selected for treatment.

Three water treatment process combinations were investigated. The first process combination included alum coagulation, sedimentation, intermediate chlorination, gravity filtration, granular activated carbon (GAC) adsorption and free chlorine disinfection. The second procees substituted ozone as the intermediate oxidant. The final combination consisted of lime coagulation, sedimentation, recarbonation, gravity filtration, GAC adsorption at twice the contact time, ozone and chloramine for final disinfection.

An extensive water quality analysis program was conducted to determine the acceptability of the water for human consumption. The sampling frequency rates exceeded recommended standards. The analytical program parameters included physical and aesthetical (13); major cations, anions and nutrients (19); trace metals (24); radiological (5); microbiological (6) including enteric viruses (41 identifiable types), parasites (7), and four bacterial groups; organic (151); and toxicological (2). Finished water samples were collected from three MWA water treatment plants to compare their water quality against the project's finished water quality.

Within the limits of the analytical techniques used and the influent water quality conditions observed it was concluded that the three process combinations monitored were technically feasible of producing a water acceptable for human consumption.

Estimated treatment cost for a 200 MGD estuary water treatment plant, using design and operating criteria similiar to that used in the EEWTP, are approximately 34.3¢/1000 gallons for the first alum mode and 47.6¢/1000 gallons for the lime mode of operations. Due to uncertainties over the plant's location, intake and certain finished water structures and related costs were excluded from the cost estimates.

U.S. ARMY
CORPS OF ENGINEERS
BALTIMORE DISTRICT

OPERATION, MAINTENANCE AND PERFORMANCE EVALUATION of the POTOMAC ESTUARY EXPERIMENTAL WATER TREATMENT PLANT

APPENDIX - VOLUME 2

SEPTEMBER 1980 - SEPTEMBER 1983

JAMES M. MONTGOMERY, CONSULTING ENGINEERS, INC.

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LIST OF ABBREVIATIONS

In order to conserve space and improve readability, the following abbreviations have been used in this report:

A	area
ACS	automatic composite sampler
BNA	base/neutral acid extraction
BOD_5	5-day biochemical oxygen demand
cm	centimeter
CLS	closed-loop stripping
^oC	degrees centigrade
D.C.	District of Columbia
DEM	Dynamic Estuary Model
D.L.	detection limit
D.T.	detention time
ECD	electron capture detector
EEWTP	Estuary Experimental Water Treatment Plant
EPA	Environmental Protection Agency
ERL	Environmental Research Laboratory
eV	electron volt
FID	flame ionization detector
ft	feet
g	grams
G	mixing energy
GAC	granular activated carbon
GC	gas chromatograph
gpd	gallons per day
gpm	gallons per minute
HERL	Health Effects Research Lab
hp	horsepower
HP	Hewlett Packard
HPLC	high performance liquid chromatography
HSDM	Homogenous Surface Diffusion Model
IC	Ion Chromatograph

List of Abbreviations

ICAP	inductively coupled argon plasma
ID	inside diameter
JAWWA	Journal of the American Water Works Association
JMM	James M. Montgomery, Consulting Engineers, Inc.
JWPCF	Journal of the Water Pollution Control Federation
KV	kilovolts
M	moles/liter
MBAS	Methylene-Blue Active Substances
µm	micrometers
ug/L	microgram/liter
µl	microliters
µmho	micromho
MDC	minimal detectable concentration
MDL	minimum detection limit
MF	membrane filter
MFL	million fibers per liter
MGD	million gallons per day
mg/L	milligram/liter
MINC	Modular Instrument Computer
mm	millimeter
mM	millimole/liter
MPI	Malcolm Pirnie, Inc.
MPN	most probable number
MS	mass spectrometer
mw	molecular weight
MWA	Metropolitan Washington Area
N	normal concentration
NAS/NAE	National Academy of Science/National Academy of Engineers
nm	nanometer
NRC	National Research Council
NTU	nephelometric turbidity unit
ODCS	Operator Data Collection System
P/A	precision/accuracy
PDF	probability density function
PM	preventive maintenance

List of Abbreviations

ppb	parts per billion
ppm	parts per million
psi	pounds per square inch
Q	volumetric flow
QA	quality assurance
QC	quality control
rpm	revolutions per minute
RWQTP	Routine Water Quality Testing Program
sec	seconds
SIMS	Sample Information and Management System
SOCs	synthetic organic chemicals
SPC	standard plate count
TAC	technical advisory committee
TDS	total dissolved solids
THM	trihalomethanes
TTHM	total trihalomethanes
TOC	total organic carbon
TON	total organic nitrogen
TOX	total organic halide
TPPAM	Testing Program for Process Adjustment and Modification
TSS	total suspended solids
UV	ultra violet (light)
VAX	Virtual Access Extension
VOA	volatile organic analyses
wt	weight
WQ	water quality
yr	year

APPENDIX F

CHARACTERIZATION OF INFLUENTS

OVERVIEW

This appendix provides statistical summary tables for the two source waters and blended influent at the EEWTP. The data summarized here were collected over a twenty-two and one half month period between 16 March 1981 and 1 February 1983.

The data are organized by parameter group, as indicated below:

F-1 Physical/Aesthetic Parameters
F-2 Asbestos Fibers
- a. Concentration
- b. Characterization

F-3 Major Cations, Anions and Nutrients
F-4 Trace Metals
F-5 Radiological Parameters
F-6 Microbiological Parameters
F-7 Viruses
- a. Quantification
- b. Identification

F-8 Parasites
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F-10 Synthetic Organic Chemicals - Halogenated Alkanes
F-11 Synthetic Organic Chemicals - Halogenated Alkenes
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F-16 Organic chemicals Tentatively Identified by Volatile Organic Analysis (Purge and Trap GC/MS)
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F-18 Organic Chemicals Tentatively Identified by Base/Neutral Extraction and GC/MS
F-19 Organic Chemicals Tentatively Identified by Closed Loop Stripping and GC/MS
F-20 Ames Test Results

It should be noted that not all of the analyses were conducted for the entire twenty-two and one half month period. Exceptions are noted on the tables, either with specific text, or with one of the following symbols either at the location heading or next to the "No. of Samples":

*	Analysis terminated on 1 December 1981
**	Analysis initiated on 1 December 1981
+	Analysis terminated on 16 March 1982
++	Analysis initiated on 16 March 1982

All data reported here are from 24-hour composite samples unless noted otherwise (next to the parameter name). In some cases, a negligible number of composite samples were missed, and grab samples taken in their place are included with the data analysis.

The statistical results reported in the tables of this appendix have been calculated using the techniques described in the Main Volume of the report, Chapter 5. These have been summarized in Table 5.1-2 of that chapter. As discussed in Chapter 5, the geometric mean and spread factor have only been calculated in cases where 15 percent or more of the samples were quantified. Otherwise, results for these statistical parameters have been left blank.

Additional symbols utilized in the tables of this appendix are described below:

ND:	Not Detected. Arithmetic mean is reported as ND if all sample concentrations were reported as "ND."
NQ:	Not Quantifiable. Arithmetic Mean is reported as NQ if all sample concentrations were either "ND" or "NQ," but all were not "ND." (Organic chemicals only.)
Not Calculated:	Geometric mean is reported as "Not Calculated" if there were greater than 15 percent of the samples quantified but geometric mean calculation was still not feasible. This only occurred in cases where all quantified results had the same numerical value.

TABLE F-1
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
PHYSICAL/AESTHETIC PARAMETERS

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Temperature, deg. C [in-situ readings]			
No. of Readings	654	677	681
Arithmetic Mean	21.1	15.2	18.6
Standard Deviation	5.2	8.8	6.6
Median Value	22.0	15.6	18.0
Minimum Value	4.0	0.0	6.0
Maximum Value	29.5	29.0	29.5
pH [grab samples]			
No. of Readings	3547	3732	3769
Arithmetic Mean	6.7	7.3	7.0
Standard Deviation	0.3	0.4	0.3
Geometric Mean	6.7	7.3	7.0
Spread Factor	1.05	1.05	1.04
Median Value	6.7	7.3	7.1
Minimum Value	4.9	6.3	5.9
Maximum Value	7.7	9.0	8.3
Dissolved Oxygen [grab samples] (MDL=0.15 mg/l)			
No. of Readings	600	636	625
Arithmetic Mean	7.8	8.4	8.4
Standard Deviation	1.2	3.1	1.7
Geometric Mean	7.7	7.7	8.2
Spread Factor	1.19	1.57	1.23
Median Value	8.0	8.4	8.5
Minimum Value	1.6	1.4	4.1
Maximum Value	11.5	16.8	12.5
Turbidity (MDL= 0.05 NTU)			
No. of Samples	244 (*)	252 (*)	258 (*)
No. Above MDL	244	252	258
Arithmetic Mean	5.20	21.09	12.08
Standard Deviation	3.97	9.86	5.91
Geometric Mean	4.50	19.53	10.93
Spread Factor	1.61	1.47	1.63
Median Value	4.10	19.00	11.00
90% Less Than	8.30	28.00	18.00
Turbidity [grab samples] (MDL= 0.05 NTU)			
No. of Samples	1339 (Sampling started	1393 (Sampling started	5659
No. Above MDL	1339 13 May, 1982)	1393 13 May, 1982)	5659
Arithmetic Mean	2.40	21.01	14.05
Standard Deviation	4.06	19.87	15.42
Geometric Mean	1.99	17.28	10.99
Spread Factor	1.57	1.76	1.86
Median Value	1.90	17.00	10.00
90% Less Than	3.00	32.00	22.00

TABLE F-1
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
PHYSICAL/AESTHETIC PARAMETERS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Total Suspended Solids (TSS)			
(MDL= 3.6 mg/l)			
No. of Samples	218	239	238
No. Above MDL	192	237	235
Arithmetic Mean	8.61	25.06	15.73
Standard Deviation	8.00	16.72	12.16
Geometric Mean	6.82	21.51	13.29
Spread Factor	1.93	1.73	1.74
Median Value	6.0	22.0	13.0
90% Less Than	18.0	38.0	27.0
Apparent Color			
(MDL= 3 color units)			
No. of Samples	48 (**)	47 (**)	235
No. Above MDL	48	47	235
Arithmetic Mean	43.8	56.5	37.3
Standard Deviation	24.2	33.2	13.5
Geometric Mean	39.9	50.7	35.3
Spread Factor	1.48	1.54	1.39
Median Value	35	45	35
90% Less Than	60	80	50
MBAS			
(MDL= 0.03 mg/l)			
No. of Samples	256	268	269
No. Above MDL	255	256	267
Arithmetic Mean	0.091	0.053	0.068
Standard Deviation	0.042	0.024	0.030
Geometric Mean	0.084	0.050	0.063
Spread Factor	1.47	1.41	1.45
Median Value	0.08	0.05	0.06
90% Less Than	0.14	0.07	0.12

TABLE F-2 (A)
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 1 FEBRUARY 1983
ASBESTOS FIBER CONCENTRATION

CHRYSOTILE FIBERS

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Summary Data:			
Total Number of Samples	87	93	88
Total Volume Filtered, Liters (VT)	1.326	0.615	0.902
Equivalent Volume Examined, Liters (V)	0.0001954	0.0000902	0.0001315
Percent Filter Area Examined (V/VT * 100)	0.01474	0.01467	0.01459
Chrysotile Fiber Results:			
Total Fibers Counted (N)	476	878	641
Max. Concentration, MFL	35.114	78.781	91.820
Min. Concentration, MFL	N.D.	N.D.	N.D.
Median Concentration, MFL	1.600	6.226	2.565
90 Percentile Concentration, MFL	7.499	26.245	13.167
Average Concentration (N/V), MFL	2.436	9.739	4.874
Minimum Detection Limits			
Highest, MFL	1.463	5.262	2.280
Lowest, MFL	0.262	0.656	0.328

AMPHIBOLE FIBERS

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Summary Data:			
Total Number of Samples	11	15	9
Total Volume Filtered, Liters (VT)	0.149	0.087	0.098
Equivalent Volume Examined, Liters (V)	0.0000227	0.0000130	0.0000148
Percent Filter Area Examined (V/VT * 100)	0.01524	0.01488	0.01518
Amphibole Fiber Results:			
Total Fibers Counted (N)	5	12	1
Max. Concentration, MFL	1.312	7.600	0.698
Min. Concentration, MFL	N.D.	N.D.	N.D.
Median Concentration, MFL	N.D.	N.D.	N.D.
90 Percentile Concentration, MFL	0.345	3.645	0.698
Average Concentration (N/V), MFL	0.220	0.923	0.067
Minimum Detection Limits			
Highest, MFL	1.312	3.800	1.312
Lowest, MFL	0.262	0.656	0.328

TABLE F-2 (B)
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 1 FEBRUARY 1983
ASBESTOS FIBER CHARACTERIZATION

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Chrysotile Fibers:			
Number of Fibers Examined *	399	827	571
Length Distribution, Fibers/Samples			
0.0 - 0.49 um	66/28	104/35	78/26
0.50 - 0.9 um	156/37	289/57	245/39
1.0 - 1.4 um	84/33	187/52	121/37
1.5 - 1.9 um	33/18	82/36	50/24
2.0 - 2.4 um	21/14	65/35	32/19
> 2.5 um	39/18	100/42	45/26
Width Distribution, Fibers/Samples			
0.00 - 0.04 um	38/19	69/22	53/19
0.05 - 0.09 um	292/37	627/60	444/39
0.10 - 0.14 um	45/23	112/44	52/22
0.15 - 0.19 um	8/7	9/7	13/9
0.20 - 0.24 um	6/6	1/1	3/3
> 2.5 um	10/6	9/6	6/6
Aspect Ratio Distribution, Fibers/Samples			
0.0 - 9.0	115/32	189/48	128/30
10.0 - 19.9	167/37	302/57	259/39
20.0 - 29.9	52/27	143/48	94/28
30.0 - 39.9	24/13	81/39	41/20
40.0 - 49.9	19/14	41/27	18/13
> 50.0	22/12	71/35	31/21
Amphibole Fibers:			
Number of Fibers Examined *	0	0	0
Length Distribution, Fibers/Samples			
0.0 - 0.49 um	0/0	0/0	0/0
0.50 - 0.9 um	0/0	0/0	0/0
1.0 - 1.4 um	0/0	0/0	0/0
1.5 - 1.9 um	0/0	0/0	0/0
2.0 - 2.4 um	0/0	0/0	0/0
> 2.5 um	0/0	0/0	0/0
Width Distribution, Fibers/Samples			
0.00 - 0.04 um	0/0	0/0	0/0
0.05 - 0.09 um	0/0	0/0	0/0
0.10 - 0.14 um	0/0	0/0	0/0
0.15 - 0.19 um	0/0	0/0	0/0
0.20 - 0.24 um	0/0	0/0	0/0
> 2.5 um	0/0	0/0	0/0
Aspect Ratio Distribution, Fibers/Samples			
0.0 - 9.0	0/0	0/0	0/0
10.0 - 19.9	0/0	0/0	0/0
20.0 - 29.9	0/0	0/0	0/0
30.0 - 39.9	0/0	0/0	0/0
40.0 - 49.9	0/0	0/0	0/0
> 50.0	0/0	0/0	0/0

* Only those fibers from samples with 5 or more fibers were used.

TABLE F-3
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
MAJOR CATIONS, ANIONS, AND NUTRIENTS

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Total Dissolved Solids (TDS): by evaporation			
(MDL=10.0 mg/l)			
No. of Samples	173 (*)	183 (*)	183 (*)
No. Above MDL	173	183	183
Arithmetic Mean	374.9	193.6	268.3
Standard Deviation	86.0	49.5	45.5
Geometric Mean	369.5	187.1	264.3
Spread Factor	1.16	1.30	1.19
Median Value	369	188	266
90% Less Than	424	265	328
Total Dissolved Solids (TDS): by addition			
(MDL= 1 mg/l)			
No. of Samples	93 (**)	105 (**)	99 (**)
No. Above MDL	93	105	99
Arithmetic Mean	310.8	181.0	246.5
Standard Deviation	44.1	49.2	40.9
Geometric Mean	307.8	174.3	242.9
Spread Factor	1.15	1.32	1.19
Median Value	307	177	244
90% Less Than	361	247	297
Electroconductivity (grab samples at blended influent site, composites elsewhere)			
(MDL= 0.1 umho/cm)			
No. of Samples	257	274	3419
No. Above MDL	257	274	3419
Arithmetic Mean	599.3	328.7	451.1
Standard Deviation	69.1	79.4	81.7
Geometric Mean	595.5	319.1	442.3
Spread Factor	1.12	1.28	1.23
Median Value	600.0	330.0	440.0
90% Less Than	693.0	424.0	555.0
Calcium			
(MDL= 0.2 mg/l)			
No. of Samples	101 (**)	109 (**)	358
No. Above MDL	101	109	358
Arithmetic Mean	56.12	37.05	46.82
Standard Deviation	8.59	8.33	7.98
Geometric Mean	55.44	36.10	46.13
Spread Factor	1.17	1.26	1.19
Median Value	56.8	37.0	46.6
90% Less Than	66.4	48.3	58.0
Hardness: by addition (Ca+Mg, as CaCO3)			
(MDL= 1.0 mg/l-CaCO3)			
No. of Samples	101 (**)	109 (**)	358
No. Above MDL	101	109	358
Arithmetic Mean	174.1	125.2	150.8
Standard Deviation	24.7	27.9	25.0
Geometric Mean	172.3	121.9	148.7
Spread Factor	1.16	1.26	1.18
Median Value	175	125	150
90% Less Than	205	164	185

TABLE F-3
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Magnesium (MDL= 0.1 mg/l)			
No. of Samples	101 (**)	109 (**)	358
No. Above MDL	101	109	358
Arithmetic Mean	8.26	7.93	8.23
Standard Deviation	1.23	1.89	1.59
Geometric Mean	8.17	7.70	8.08
Spread Factor	1.16	1.28	1.21
Median Value	7.8	7.8	8.0
90% Less Than	10.0	10.5	10.5
Potassium (MDL= 0.3 mg/l)			
No. of Samples	101 (**)	109 (**)	358
No. Above MDL	101	109	358
Arithmetic Mean	8.72	3.07	6.00
Standard Deviation	1.13	1.17	0.99
Geometric Mean	8.63	2.91	5.91
Spread Factor	1.16	1.37	1.20
Median Value	8.8	2.8	6.0
90% Less Than	9.9	4.1	7.1
Sodium (MDL= 0.1 mg/l)			
No. of Samples	101 (**)	109 (**)	358
No. Above MDL	101	109	358
Arithmetic Mean	43.91	16.16	29.46
Standard Deviation	12.14	7.58	6.29
Geometric Mean	42.72	14.50	28.79
Spread Factor	1.25	1.61	1.24
Median Value	42.1	14.4	29.0
90% Less Than	49.3	25.1	36.9
Alkalinity (MDL= 2.7 mg/l-CaCO3)			
No. of Samples	100 (**)	351	349
No. Above MDL	99	351	349
Arithmetic Mean	49.14	74.17	62.19
Standard Deviation	17.83	15.88	16.74
Geometric Mean	44.49	72.37	59.76
Spread Factor	1.69	1.25	1.34
Median Value	50.0	75.0	61.0
90% Less Than	70.0	95.0	85.0
Bromide (MDL= 0.003 mg/l)			
No. of Samples	99 (**)	107 (**)	347
No. Above MDL	95	99	339
Arithmetic Mean	0.0899	0.0217	0.0662
Standard Deviation	0.0590	0.0160	0.0367
Geometric Mean	0.0646	0.0167	0.0522
Spread Factor	2.75	2.25	2.33
Median Value	0.077	0.019	0.060
90% Less Than	0.180	0.040	0.120

TABLE F-3
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Nitrogen, Ammonia (MDL= 0.02 mg/l-N)			
No. of Samples	100 (**)	352	352
No. Above MDL	70	339	321
Arithmetic Mean	0.583	0.274	0.261
Standard Deviation	1.146	0.200	0.376
Geometric Mean	0.067	0.218	0.134
Spread Factor	10.76	2.16	3.24
Median Value	0.07	0.24	0.13
90% Less Than	2.40	0.46	0.70
Nitrogen, Total Kjeldahl (MDL= 0.2 mg/l-N)			
No. of Samples	99 (**)	107 (**)	344
No. Above MDL	99	106	328
Arithmetic Mean	1.55	0.87	1.00
Standard Deviation	1.19	0.45	0.57
Geometric Mean	1.21	0.78	0.85
Spread Factor	1.98	1.61	1.84
Median Value	1.1	0.8	0.9
90% Less Than	3.7	1.4	1.7
Ortho Phosphate (MDL= 0.01 mg/l-P)			
No. of Samples	99 (**)	107 (**)	350
No. Above MDL	96	101	349
Arithmetic Mean	0.417	0.102	0.384
Standard Deviation	0.246	0.055	0.323
Geometric Mean	0.336	0.083	0.315
Spread Factor	2.27	2.15	1.83
Median Value	0.36	0.10	0.30
90% Less Than	0.70	0.16	0.63
Silica (MDL= 0.2 mg/l)			
No. of Samples	334	352	351
No. Above MDL	333	351	351
Arithmetic Mean	9.24	5.03	6.75
Standard Deviation	2.17	2.52	2.09
Geometric Mean	8.86	4.34	6.40
Spread Factor	1.42	1.79	1.41
Median Value	9.3	4.7	6.6
90% Less Than	11.7	8.6	9.6
Sulfate (MDL= 0.6 mg/l)			
No. of Samples	336	353	351
No. Above MDL	336	353	351
Arithmetic Mean	79.62	49.39	63.52
Standard Deviation	19.24	15.76	15.50
Geometric Mean	77.19	46.87	61.59
Spread Factor	1.29	1.39	1.29
Median Value	80.0	48.0	60.1
90% Less Than	100.0	71.0	85.0

TABLE F-4
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Aluminum (MDL= 0.003 mg/l)			
No. of Samples	101	109	355
No. Above MDL	99	108	348
Arithmetic Mean	0.1631	0.7655	0.4694
Standard Deviation	0.2334	0.7024	0.5001
Geometric Mean	0.0979	0.5004	0.3143
Spread Factor	2.70	2.91	2.88
Median Value	0.090	0.600	0.354
90% Less Than	0.300	1.460	0.800
Antimony (MDL= 0.0003 mg/l)			
No. of Samples	23 (+)	22 (+)	273 (+)
No. Above MDL	4	4	90
Arithmetic Mean	0.00018	0.00018	0.00059
Standard Deviation	0.00009	0.00006	0.00172
Geometric Mean	0.00022	Not	0.00014
Spread Factor	1.39	Calculated	4.40
Median Value	ND	ND	ND
90% Less Than	0.0003	0.0003	0.0006
Arsenic (MDL= 0.0002 mg/l)			
No. of Samples	101	109	356
No. Above MDL	93	105	319
Arithmetic Mean	0.00057	0.00105	0.00121
Standard Deviation	0.00039	0.00064	0.00294
Geometric Mean	0.00048	0.00088	0.00067
Spread Factor	1.82	1.89	2.50
Median Value	0.0005	0.0009	0.0007
90% Less Than	0.0010	0.0020	0.0016
Barium (MDL= 0.002 mg/l)			
No. of Samples	98	107	353
No. Above MDL	97	107	346
Arithmetic Mean	0.0212	0.0443	0.0328
Standard Deviation	0.0103	0.0127	0.0122
Geometric Mean	0.0195	0.0426	0.0299
Spread Factor	1.51	1.34	1.68
Median Value	0.020	0.042	0.032
90% Less Than	0.028	0.062	0.045
Beryllium (MDL= 0.0008 mg/l)			
No. of Samples	23 (+)	27 (+)	272 (+)
No. Above MDL	1	0	0
Arithmetic Mean	0.00044	ND	ND
Standard Deviation	0.00019		
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND

TABLE F-4
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Boron			
(MDL= 0.0040 mg/l)			
No. of Samples	101	109	356
No. Above MDL	100	108	354
Arithmetic Mean	0.08589	0.02587	0.05133
Standard Deviation	0.02960	0.02260	0.03647
Geometric Mean	0.07937	0.02104	0.04151
Spread Factor	1.59	1.86	2.07
Median Value	0.0890	0.0212	0.0518
90% Less Than	0.1170	0.0435	0.0770
Cadmium: ICAP			
(MDL= 0.0008 mg/l)			
No. of Samples			250 (*)
No. Above MDL			54
Arithmetic Mean			0.00062
Standard Deviation			0.00058
Geometric Mean			0.00041
Spread Factor			2.31
Median Value			ND
90% Less Than			0.0012
Cadmium: furnace AAS			
(MDL= 0.0002 mg/l)			
No. of Samples	101	109	104 (**)
No. Above MDL	15	27	27
Arithmetic Mean	0.00017	0.00039	0.00021
Standard Deviation	0.00025	0.00147	0.00035
Geometric Mean		0.00006	0.00009
Spread Factor		5.78	3.43
Median Value	ND	ND	ND
90% Less Than	0.0003	0.0005	0.0004
Chromium: ICAP			
(MDL= 0.003 mg/l)			
No. of Samples			250 (*)
No. Above MDL			78
Arithmetic Mean			0.0025
Standard Deviation			0.0019
Geometric Mean			0.0022
Spread Factor			1.84
Median Value			ND
90% Less Than			0.005
Chromium: furnace AAS			
(MDL= 0.0002 mg/l)			
No. of Samples	100	108	103 (**)
No. Above MDL	96	102	100
Arithmetic Mean	0.00924	0.00505	0.00674
Standard Deviation	0.01247	0.00736	0.00900
Geometric Mean	0.00577	0.00296	0.00451
Spread Factor	2.86	3.12	2.56
Median Value	0.0063	0.0034	0.0048
90% Less Than	0.0144	0.0100	0.0108

TABLE F-4
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Cobalt: ICAP			
(MDL= 0.003 mg/l)			
No. of Samples			251 (**)
No. Above MDL			8
Arithmetic Mean			0.0016
Standard Deviation			0.0005
Median Value			ND
90% Less Than			ND
Cobalt: furnace AAS			
(MDL= 0.0001 mg/l)			(**)
No. of Samples	23 (+)	22 (+)	22 (+)
No. Above MDL	23	22	22
Arithmetic Mean	0.00498	0.00185	0.00518
Standard Deviation	0.00287	0.00216	0.00542
Geometric Mean	0.00420	0.00111	0.00374
Spread Factor	1.84	2.71	2.13
Median Value	0.0045	0.0007	0.0032
90% Less Than	0.0088	0.0042	0.0090
Copper: ICAP			
(MDL= 0.0008 mg/l)			
No. of Samples			251 (*)
No. Above MDL			240
Arithmetic Mean			0.00755
Standard Deviation			0.00532
Geometric Mean			0.00609
Spread Factor			2.07
Median Value			0.0068
90% Less Than			0.0129
Copper: flame AAS			
(MDL= 0.0012 mg/l)			
No. of Samples	101	109	105 (**)
No. Above MDL	100	103	103
Arithmetic Mean	0.01074	0.00581	0.00886
Standard Deviation	0.00493	0.00309	0.00496
Geometric Mean	0.00980	0.00499	0.00773
Spread Factor	1.56	1.84	1.72
Median Value	0.0099	0.0053	0.0083
90% Less Than	0.0167	0.0096	0.0140
Iron			
(MDL= 0.003 mg/l)			
No. of Samples	101	109	354
No. Above MDL	101	109	353
Arithmetic Mean	1.6153	1.2646	1.3698
Standard Deviation	1.0945	0.9900	0.9492
Geometric Mean	1.3295	0.9495	1.0671
Spread Factor	2.09	2.24	2.33
Median Value	1.300	1.100	1.160
90% Less Than	3.020	2.210	2.380

TABLE F-4
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Lead			
(MDL= 0.0003 mg/l)			
No. of Samples	101	109	355
No. Above MDL	98	92	325
Arithmetic Mean	0.00224	0.00317	0.00299
Standard Deviation	0.00183	0.00811	0.00638
Geometric Mean	0.00164	0.00104	0.00169
Spread Factor	2.31	3.64	2.84
Median Value	0.0017	0.0016	0.0018
90% Less Than	0.0048	0.0049	0.0057
Lithium: ICAP			
(MDL= 0.0010 mg/l)			
No. of Samples			251 (*)
No. Above MDL			249
Arithmetic Mean			0.00567
Standard Deviation			0.00620
Geometric Mean			0.00494
Spread Factor			1.59
Median Value			0.0053
90% Less Than			0.0073
Lithium: flame AAS			
(MDL= 0.0004 mg/l)			
No. of Samples	101	109	104 (**)
No. Above MDL	100	107	103
Arithmetic Mean	0.00673	0.00416	0.00591
Standard Deviation	0.00315	0.00183	0.00276
Geometric Mean	0.00610	0.00376	0.00547
Spread Factor	1.64	1.67	1.51
Median Value	0.0064	0.0041	0.0054
90% Less Than	0.0088	0.0058	0.0076
Manganese			
(MDL= 0.0010 mg/l)			
No. of Samples	106	113	356
No. Above MDL	106	113	356
Arithmetic Mean	0.24304	0.14319	0.19705
Standard Deviation	0.17487	0.10024	0.15476
Geometric Mean	0.18495	0.11545	0.15904
Spread Factor	2.41	1.94	1.96
Median Value	0.1880	0.1240	0.1700
90% Less Than	0.4580	0.2670	0.3400
Mercury			
(MDL= 0.00027 mg/l)			
No. of Samples	101	109	349
No. Above MDL	27	11	72
Arithmetic Mean	0.00032	0.00020	0.00048
Standard Deviation	0.00057	0.00033	0.00384
Geometric Mean	0.00011		0.00008
Spread Factor	3.88		4.49
Median Value	ND	ND	ND
90% Less Than	0.0005	0.0003	0.0004

TABLE F-4
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Molybdenum			
(MDL= 0.002 mg/l)			
No. of Samples	20 (+)	20 (+)	271 (+)
No. Above MDL	1	1	12
Arithmetic Mean	0.0011	0.0014	0.0012
Standard Deviation	0.0006	0.0016	0.0013
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Nickel			
(MDL= 0.0010 mg/l)			
No. of Samples	101	109	350
No. Above MDL	96	101	328
Arithmetic Mean	0.00911	0.00788	0.00491
Standard Deviation	0.00495	0.00560	0.00300
Geometric Mean	0.00766	0.00575	0.00413
Spread Factor	1.97	2.46	1.88
Median Value	0.0086	0.0070	0.0044
90% Less Than	0.0137	0.0155	0.0082
Selenium			
(MDL= 0.0002 mg/l)			
No. of Samples	101	109	356
No. Above MDL	28	36	211
Arithmetic Mean	0.00033	0.00043	0.00096
Standard Deviation	0.00053	0.00086	0.00179
Geometric Mean	0.00007	0.00009	0.00052
Spread Factor	6.32	6.60	5.10
Median Value	ND	ND	0.0003
90% Less Than	0.0009	0.0014	0.0025
Silver: flame AAS			
(MDL= 0.0008 mg/l)			
No. of Samples			251 (*)
No. Above MDL			37
Arithmetic Mean			0.00052
Standard Deviation			0.00038
Median Value			ND
90% Less Than			0.0008
Silver: furnace AAS			
(MDL= 0.0002 mg/l)			
No. of Samples	101	108	105 (**)
No. Above MDL	92	58	70
Arithmetic Mean	0.00111	0.00032	0.00055
Standard Deviation	0.00258	0.00040	0.00067
Geometric Mean	0.00059	0.00021	0.00031
Spread Factor	2.70	2.53	3.05
Median Value	0.0005	0.0002	0.0003
90% Less Than	0.0021	0.0007	0.0014

TABLE F-4
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Thallium			
(MDL= 0.0009 mg/l)			
No. of Samples	23 (+)	22 (+)	273 (+)
No. Above MDL	0	0	2
Arithmetic Mean	ND	ND	0.00045
Standard Deviation			0.00004
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Tin			
(MDL= 0.0040 mg/l)			
No. of Samples	20 (+)	20 (+)	270 (+)
No. Above MDL	4	1	79
Arithmetic Mean	0.00344	0.00217	0.00373
Standard Deviation	0.00323	0.00076	0.00435
Geometric Mean	0.00148		0.00248
Spread Factor	3.41		2.40
Median Value	ND	ND	ND
90% Less Than	0.0087	ND	0.0075
Titanium			
(MDL= 0.0020 mg/l)			
No. of Samples	98	107	353
No. Above MDL	94	86	310
Arithmetic Mean	0.0263	0.0090	0.0121
Standard Deviation	0.0172	0.0090	0.0109
Geometric Mean	0.0211	0.0061	0.0084
Spread Factor	2.13	2.66	2.58
Median Value	0.0228	0.0076	0.0099
90% Less Than	0.0460	0.0160	0.0240
Vanadium			
(MDL= 0.0020 mg/l)			
No. of Samples	98	107	354
No. Above MDL	84	66	272
Arithmetic Mean	0.00628	0.00320	0.00484
Standard Deviation	0.00343	0.00309	0.00532
Geometric Mean	0.00538	0.00255	0.00359
Spread Factor	1.89	2.04	2.17
Median Value	0.0066	0.0029	0.0036
90% Less Than	0.0098	0.0052	0.0092
Zinc: ICAP			
(MDL= 0.0020 mg/l)			
No. of Samples			250 (*)
No. Above MDL			250
Arithmetic Mean			0.02399
Standard Deviation			0.02160
Geometric Mean			0.02085
Spread Factor			1.63
Median Value			0.0213
90% Less Than			0.0350

TABLE F-4
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Zinc: flame AAS (MDL= 0.0012 mg/l)			
No. of Samples	101	109	105 (**)
No. Above MDL	101	109	105
Arithmetic Mean	0.02836	0.01690	0.02562
Standard Deviation	0.01782	0.01118	0.01886
Geometric Mean	0.02456	0.01418	0.02115
Spread Factor	1.67	1.81	1.81
Median Value	0.0230	0.0139	0.0199
90% Less Than	0.0496	0.0300	0.0468

TABLE F-5
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
RADIOLOGICAL PARAMETERS

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Gross Alpha			
(MDL= 0.1 pCi/l)			
No. of Samples	32	31	65
No. Above MDL	17	21	38
Arithmetic Mean	0.55	0.57	0.52
Standard Deviation	0.62	0.46	0.62
Geometric Mean	0.15	0.30	0.17
Spread Factor	7.32	4.20	6.01
Median Value	0.1	0.6	0.2
90% Less Than	1.6	1.0	1.6
Gross Alpha 2s Error			
(MDL= 0.1 pCi/l)			
No. of Samples	32	31	58
No. Above MDL	32	31	58
Arithmetic Mean	0.63	0.55	0.64
Standard Deviation	0.20	0.15	0.31
Geometric Mean	0.59	0.53	0.58
Spread Factor	1.46	1.35	1.61
Median Value	0.6	0.5	0.6
90% Less Than	0.9	0.7	1.0
Gross Beta			
(MDL= 0.1 pCi/l)			
No. of Samples	32	31	66
No. Above MDL	32	31	61
Arithmetic Mean	8.40	4.12	6.46
Standard Deviation	2.10	2.58	4.19
Geometric Mean	8.08	3.66	3.99
Spread Factor	1.35	1.58	4.22
Median Value	8.7	3.6	6.3
90% Less Than	10.7	6.0	9.7
Gross Beta 2s Error			
(MDL= 0.1 pCi/l)			
No. of Samples	32	31	59
No. Above MDL	32	31	59
Arithmetic Mean	1.56	1.16	1.83
Standard Deviation	0.37	0.37	0.87
Geometric Mean	1.53	1.12	1.68
Spread Factor	1.23	1.32	1.50
Median Value	1.5	1.0	1.5
90% Less Than	2.3	1.8	3.8
Strontium-90 (Note: Analyzed only for selected dates where Gross Beta + 2 sigma > 8 pCi/L at plant sites)			
(MDL= 0.2 pCi/l)			
No. of Samples	13	1	24
No. Above MDL	8	0	14
Arithmetic Mean	0.75	ND	0.85
Standard Deviation	0.77		1.44
Geometric Mean	0.38		0.15
Spread Factor	3.88		9.17
Median Value	0.6	ND	0.1
90% Less Than	1.7	ND	2.5

TABLE F-5
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
RADIOLOGICAL PARAMETERS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Strontium-90 2s error (Note: Analyzed only for selected dates where Gross Beta + 2 sigma > 8 pCi/L at plant sites)			
(MDL= 0.2 pCi/l)			
No. of Samples	13	1	24
No. Above MDL	13	1	24
Arithmetic Mean	0.47	0.90	0.45
Standard Deviation	0.15		0.20
Geometric Mean	0.45	0.90	0.41
Spread Factor	1.37	1.00	1.49
Median Value	0.5	0.9	0.4
90% Less Than	0.6	0.9	0.8
Tritium			
(MDL=1000 pCi/l)			
No. of Samples	1 (++)	1 (++)	6 (++)
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND

TABLE F-6
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
MICROBIOLOGICAL PARAMETERS

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Total Coliform (confirmed): 0.1,0.01,0.001 ml volumes [grab samples] (MDL=180 MPN/100 ml;UQL=240000 MPN/100 m)			
No. of Samples		240	64 (**)
No. of Positives		235	64
No. of TNTC		8	3
Geometric Mean		6198.1	32831.0
Spread Factor		5.02	2.92
Median Value		4900	24000
90% Less Than		54000	160000
Maximum Value		>UQL	>UQL
Total Coliform (confirmed): 0.01,0.001,0.0001 ml volumes [grab samples] (MDL=1800 MPN/100 ml;UQL=2400000 MPN/100)			
No. of Samples	232		
No. of Positives	231		
No. of TNTC	2		
Geometric Mean	56845.4		
Spread Factor	3.27		
Median Value	49000		
90% Less Than	350000		
Maximum Value	>UQL		
Fecal Coliform (confirmed): 0.1,0.01,0.001 ml volumes [grab samples] (MDL=180 MPN/100 ml;UQL=240000 MPN/100 m)		(*)	
No. of Samples		221 (++)	44 (++)
No. of Positives		165	44
No. of TNTC		1	0
Geometric Mean		621.8	6342.8
Spread Factor		7.47	2.73
Median Value		680	4900
90% Less Than		7000	24000
Maximum Value		>UQL	92000
Fecal Coliform (confirmed): 0.01,0.001,0.0001 ml volumes [grab samples] (MDL=1800 MPN/100 ml;UQL=2400000 MPN/100)			
No. of Samples	209 (*) (++)		
No. of Positives	198		
No. of TNTC	0		
Geometric Mean	11438.8		
Spread Factor	3.62		
Median Value	13000		
90% Less Than	50000		
Maximum Value	920000		
Standard Plate Count: 0.1 ml volume [grab samples] (MDL= 10.0 colonies/m)			
No. of Samples		233	
No. of Positives		232	
Geometric Mean		7793.2	
Spread Factor		3.81	
Median Value		8000	
90% Less Than		40000	
Maximum Value		160000	

TABLE F-6
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
MICROBIOLOGICAL PARAMETERS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Standard Plate Count: 0.01 ml volume [grab samples]			
(MDL=100 colonies/ml)			
No. of Samples	230		61 (**)
No. of Positives	230		61
Geometric Mean	21235.7		16661.9
Spread Factor	2.79		2.48
Median Value	20000		16000
90% Less Than	80000		40000
Maximum Value	1400000		500000
Salmonella: 100 ml volume [grab samples]			
(MDL=0.22 MPN/100 ml;UQL= 1.6 MPN/100 ml)			
No. of Samples	12	14	14 (**)
No. of Positives	6	3	9
No. of TNTC	0	0	0
Geometric Mean	0.187	Not	0.252
Spread Factor	2.84	Calculated	2.37
Median Value	ND	ND	0.22
90% Less Than	0.92	0.22	0.92
Maximum Value	1.60	0.22	1.60
Salmonella: 10 ml volume [grab samples]			
(MDL= 2.2 MPN/100 ml;UQL=16.0 MPN/100 ml)			
No. of Samples	9	6	
No. of Positives	5	0	
No. of TNTC	0	0	
Geometric Mean	2.3636		
Spread Factor	2.24		
Median Value	2.200	ND	
90% Less Than	9.200	ND	
Maximum Value	9.200	ND	
Endotoxin [grab samples]			
(MDL=0.006 ng/ml)			(**)
No. of Samples	9 (+)	9 (+)	1 (+)
No. Above MDL	9	9	1
Arithmetic Mean	88.8333	62.4556	62.4000
Standard Deviation	72.7456	72.6314	
Geometric Mean	65.9598	42.6962	62.400
Spread Factor	2.20	2.24	1.00
Median Value	62.400	50.000	62.400
90% Less Than	250.000	250.000	62.400

TABLE F-7 (A)
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 16 MARCH 1983
VIRUS ASSAY

Sampling Date	Volume Filtered (Gallons)	Cell Line	Lower Detection Limit (MPNCU/Gallon)	Concentration (MPNCU/Gallon)
Blue Plains Nitrified Effluent (Monitored only during Phase IA)				
22-Apr-1981	93.0	BGM cell line	.043	N.D.
		RD cell line	.043	N.D.
28-May-1981	448.0	BGM cell line	.010	N.D.
		RD cell line	.010	N.D.
1-Jul-1981	1000.0	BGM cell line	.002	N.D.
		RD cell line	.002	N.D.
15-Jul-1981	683.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
26-Aug-1981	364.0	BGM cell line	.042	N.D.
		MA104 cell line	.042	N.D.
6-Oct-1981	400.0	BGM cell line	.020	> .020
		MA104 cell line	.040	> .040
10-Nov-1981	250.0	BGM cell line	.066	> .066
		MA104 cell line	.072	> .072
18-Dec-1981	431.0	BGM cell line	.022	N.D.
		MA104 cell line	.022	N.D.
20-Jan-1982	107.0	BGM cell line	.168	> .168
		MA104 cell line	.140	> .140
19-Feb-1982	286.0	BGM cell line	.013	> .042
		MA104 cell line	.013	> .042
Potomac River Estuary (Monitored only during Phase IA)				
22-Apr-1981	105.0	BGM cell line	.030	N.D.
		RD cell line	.030	N.D.
28-May-1981	217.0	BGM cell line	.016	N.D.
		RD cell line	.016	N.D.
2-Jul-1981	1000.0	BGM cell line	.003	N.D.
		RD cell line	.003	N.D.
15-Jul-1981	150.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
26-Aug-1981	146.0	BGM cell line	.092	N.D.
		MA104 cell line	.092	.092
6-Oct-1981	123.0	BGM cell line	.122	.122
		MA104 cell line	.122	.122
6-Nov-1981	61.0	BGM cell line	.252	N.D.
		MA104 cell line	.252	N.D.
17-Dec-1981	127.0	BGM cell line	.082	.082
		MA104 cell line	.082	N.D.
18-Jan-1982	85.0	BGM cell line	.152	> .152
		MA104 cell line	.122	> .122
18-Feb-1982	67.0	BGM cell line	.076	> .170
		MA104 cell line	.076	.269
12-Mar-1982	114.0	BGM cell line	.052	> .117
		MA104 cell line	.052	.117
19-Mar-1982	45.0	BGM cell line	.060	N.D.
		MA104 cell line	.060	N.D.
25-Mar-1982	20.0	BGM cell line	.140	N.D.
		MA104 cell line	.210	N.D.
EEWTP Blended Influent (Phase IA) (Note: Monitoring initiated in December, 1981)				
17-Dec-1981	281.0	BGM cell line	.040	N.D.
		MA104 cell line	.040	N.D.
21-Jan-1982	300.0	BGM cell line	.016	N.D.
		MA104 cell line	.009	N.D.
19-Feb-1982	333.0	BGM cell line	.016	N.D.
		MA104 cell line	.016	N.D.
13-Mar-1982	130.0	BGM cell line	.056	> .122
		MA104 cell line	.056	> .097
EEWTP Blended Influent (Phase IB)				
10-Apr-1982	80.0	BGM cell line	.020	N.D.
		MA104 cell line	.040	N.D.
12-Apr-1982	87.0	BGM cell line	.050	N.D.
		MA104 cell line	.050	N.D.

TABLE F-7 (A)
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 16 MARCH 1983
VIRUS ASSAY
(Continued)

Sampling Date	Volume Filtered (Gallons)	Cell Line	Lower Detection Limit (MPNCU/Gallon)	Concentration (MPNCU/Gallon)
		EEWTP Blended Influent (Phase IB, continued)		
13-Apr-1982	106.0	BGM cell line	.040	N.D.
		MA104 cell line	.040	N.D.
16-Apr-1982	213.0	BGM cell line	.020	N.D.
		MA104 cell line	.020	N.D.
7-May-1982	119.0	BGM cell line	.022	N.D.
		MA104 cell line	.022	N.D.
14-May-1982	344.0	BGM cell line	.008	N.D.
		MA104 cell line	.008	N.D.
28-May-1982	325.0	BGM cell line	.008	N.D.
		MA104 cell line	.008	.008
7-Jun-1982	173.0	BGM cell line	.013	.148
		MA104 cell line	.013	.013
8-Jun-1982	321.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
11-Jun-1982	296.0	BGM cell line	.008	.116
		MA104 cell line	.008	> .166
18-Jun-1982	76.0	BGM cell line	.032	.112
		MA104 cell line	.032	.070
25-Jun-1982	143.0	BGM cell line	.017	.266
		MA104 cell line	.017	.199
2-Jul-1982	183.0	BGM cell line	.011	N.D.
		MA104 cell line	.011	.038
		EEWTP Blended Influent (Phase IIA)		
22-Jul-1982	220.0	BGM cell line	.010	N.D.
		MA104 cell line	.010	N.D.
29-Jul-1982	52.0	BGM cell line	.054	N.D.
		MA104 cell line	.054	N.D.
4-Aug-1982	181.0	BGM cell line	.013	N.D.
		MA104 cell line	.013	N.D.
12-Aug-1982	147.0	BGM cell line	.022	N.D.
		MA104 cell line	.022	.022
20-Aug-1982	301.0	BGM cell line	.011	N.D.
		MA104 cell line	.008	N.D.
25-Aug-1982	131.0	BGM cell line	.018	N.D.
		MA104 cell line	.018	N.D.
2-Sep-1982	67.0	BGM cell line	.036	N.D.
		MA104 cell line	.036	N.D.
3-Sep-1982	106.0	BGM cell line	.002	N.D.
		MA104 cell line	.002	N.D.
17-Sep-1982	191.0	BGM cell line	.013	N.D.
		MA104 cell line	.013	N.D.
24-Sep-1982	87.0	BGM cell line	.028	N.D.
		MA104 cell line	.028	N.D.
1-Oct-1982	105.0	BGM cell line	.024	N.D.
		MA104 cell line	.024	N.D.
8-Oct-1982	105.0	BGM cell line	.026	.054
		MA104 cell line	.019	.019
15-Oct-1982	168.0	BGM cell line	.015	N.D.
		MA104 cell line	.015	N.D.
22-Oct-1982	160.0	BGM cell line	.015	N.D.
		MA104 cell line	.015	N.D.
29-Oct-1982	140.0	BGM cell line	.019	.019
		MA104 cell line	.019	.019
5-Nov-1982	570.0	BGM cell line	.005	.005
		MA104 cell line	.005	.016
19-Nov-1982	187.5	BGM cell line	.012	.024
		MA104 cell line	.012	.024
23-Nov-1982	350.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
3-Dec-1982	300.0	BGM cell line	.007	.035
		MA104 cell line	.009	.079
10-Dec-1982	338.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	.007
17-Dec-1982	350.0	BGM cell line	.007	.007
		MA104 cell line	.007	.077
20-Dec-1982	298.0	BGM cell line	.009	.046
		MA104 cell line	.009	.049
30-Dec-1982	280.0	BGM cell line	.009	.019
		MA104 cell line	.009	N.D.
4-Jan-1983	350.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
5-Jan-1983	315.0	BGM cell line	.007	.007
		MA104 cell line	.007	N.D.

TABLE F-7 (A)
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 16 MARCH 1983
VIRUS ASSAY
(Continued)

Sampling Date	Volume Filtered (Gallons)	Cell Line	Lower Detection Limit (MPNCU/Gallon)	Concentration (MPNCU/Gallon)
		EEWTP Blend Tank (Phase IIA, continued)		
7-Jan-1983	210.0	BGM cell line	.011	.024
		MA104 cell line	.011	.024
14-Jan-1983	280.0	BGM cell line	.009	.019
		MA104 cell line	.009	.009
17-Jan-1983	245.0	BGM cell line	.010	.051
		MA104 cell line	.010	> .230
21-Jan-1983	210.0	BGM cell line	.011	.240
		MA104 cell line	.011	.240
24-Jan-1983	385.0	BGM cell line	.006	.006
		MA104 cell line	.006	.012
25-Jan-1983	259.0	BGM cell line	.009	.078
		MA104 cell line	.009	.030
15-Feb-1983	420.0	BGM cell line	.010	.231
		MA104 cell line	.010	> .231

TABLE F-7 (B)
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 16 MARCH 1983
VIRUS IDENTIFICATIONS

Sampling Date	Cell Line	Virus Type
	Blue Plains Nitrified Effluent	
6-Oct-1981	BGM cell line	Coxsackie B 4
	MA104 cell line	Unidentified virus
10-Nov-1981	BGM cell line	Coxsackie B 4
	MA104 cell line	Unidentified virus
20-Jan-1982	BGM cell line	Echovirus 7
	BGM cell line	Coxsackie B 4
	MA104 cell line	Poliovirus 2
19-Feb-1982	BGM cell line	Coxsackie B 4
	MA104 cell line	Echovirus 11
13-Mar-1982	BGM cell line	Poliovirus 2
	BGM cell line	Poliovirus 3
	MA104 cell line	Echovirus 9
	MA104 cell line	Echovirus 27
	Potomac River Estuary	
26-Aug-1981	MA104 cell line	Unidentified virus
6-Oct-1981	BGM cell line	Coxsackie B 3
17-Dec-1981	BGM cell line	Unidentified virus
18-Jan-1982	BGM cell line	Unidentified virus
	MA104 cell line	Poliovirus 2
18-Feb-1982	BGM cell line	Coxsackie B 4
	MA104 cell line	Coxsackie B 3
	MA104 cell line	Echovirus 11
12-Mar-1982	BGM cell line	Poliovirus 1
	BGM cell line	Echovirus 21
	MA104 cell line	Echovirus 27
	MA104 cell line	Echovirus 15
	EEWTP Blended Influent	
7-Jun-1982	BGM cell line	Poliovirus 3
	MA104 cell line	Unidentified virus
11-Jun-1982	BGM cell line	Echovirus 5
	BGM cell line	Coxsackie B 2
	BGM cell line	Coxsackie B 4
	MA104 cell line	Unidentified virus
18-Jun-1982	BGM cell line	Echovirus 12
	MA104 cell line	Unidentified virus
25-Jun-1982	BGM cell line	Coxsackie B 2
	BGM cell line	Echovirus 33
	BGM cell line	Echovirus 11
	MA104 cell line	Unidentified virus
28-Jun-1982	MA104 cell line	Poliovirus 3
2-Jul-1982	MA104 cell line	Unidentified virus
12-Aug-1982	MA104 cell line	Coxsackie B 4
8-Oct-1982	BGM cell line	Coxsackie B 1
	BGM cell line	Coxsackie B 2
	MA104 cell line	Coxsackie B 4
29-Oct-1982	BGM cell line	Coxsackie B 4
	MA104 cell line	Unidentified virus

TABLE F-7 (B)
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 16 MARCH 1983
VIRUS IDENTIFICATIONS
(Continued)

Sampling Date	Cell Line	Virus Type
	EEWTP Blended Influent (continued)	
5-Nov-1982	BGM cell line	Poliovirus 3
	MA104 cell line	Echovirus 32
19-Nov-1982	BGM cell line	Poliovirus 3
	BGM cell line	Coxsackie B 4
3-Dec-1982	BGM cell line	Poliovirus 2
	BGM cell line	Coxsackie B 4
	MA104 cell line	Unidentified virus
10-Dec-1982	MA104 cell line	Unidentified virus
17-Dec-1982	BGM cell line	Unidentified virus
	MA104 cell line	Unidentified virus
20-Dec-1982	BGM cell line	Coxsackie B 4
	MA104 cell line	Unidentified virus
30-Dec-1982	BGM cell line	Coxsackie B 4
5-Jan-1983	BGM cell line	Echovirus 7
7-Jan-1983	BGM cell line	Coxsackie B 4
	MA104 cell line	Unidentified virus
14-Jan-1983	BGM cell line	Poliovirus 3
	MA104 cell line	Unidentified virus
17-Jan-1983	BGM cell line	Poliovirus 1
	BGM cell line	Coxsackie B 4
	MA104 cell line	Unidentified virus
21-Jan-1983	BGM cell line	Unidentified virus
	MA104 cell line	Unidentified virus
24-Jan-1983	BGM cell line	Unidentified virus
	MA104 cell line	Unidentified virus
25-Jan-1983	BGM cell line	Unidentified virus
	MA104 cell line	Unidentified virus
25-Jan-1983	BGM cell line	Coxsackie B 1
	MA104 cell line	Unidentified virus

TABLE F-8
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 15 FEBRUARY 1983
PARASITES

Blue Plains Nitrified Effluent

Samples Assayed:	10
Total Volume Filtered (Gallons):	2157.0
Total Equivalent Volume (Gallons):	398.2
Samples with Unknown Volume:	1
Samples with Unknown Equiv. Volume:	3

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

Potomac River Estuary

Samples Assayed:	12
Total Volume Filtered (Gallons):	2835.0
Total Equivalent Volume (Gallons):	367.2
Samples with Unknown Volume:	2
Samples with Unknown Equiv. Volume:	5

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

EEWTP Blended Influent

Samples Assayed:	12
Total Volume Filtered (Gallons):	1794.5
Total Equivalent Volume (Gallons):	1139.8
Samples with Unknown Volume:	0
Samples with Unknown Equiv. Volume:	0

Parasite Name	Number Observed
Giardia	1
Entamoeba histolytica	1
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

TABLE F-9
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
ORGANIC SURROGATE PARAMETERS -- TOC AND TOX

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Total Organic Carbon: DC80 (MDL=0.06 mg/l-C)			
No. of Samples	428	217 (**)	453
No. Above MDL	428	217	453
Arithmetic Mean	5.30	3.89	4.64
Standard Deviation	1.58	1.00	1.34
Geometric Mean	5.10	3.79	4.50
Spread Factor	1.33	1.25	1.27
Median Value	5.0	3.7	4.4
90% Less Than	6.8	4.8	5.5
Total Organic Carbon: DC80 [grab samples] (MDL=0.06 mg/l-C)			
No. of Samples	9	9	1168
No. Above MDL	9	9	1168
Arithmetic Mean	4.68	3.57	4.57
Standard Deviation	0.64	0.73	0.72
Geometric Mean	4.64	3.49	4.52
Spread Factor	1.13	1.23	1.16
Median Value	4.5	3.5	4.4
90% Less Than	5.9	4.9	5.5
Total Organic Halogen (MDL=3.9 ug/l-Cl)			
No. of Samples	426	218 (**)	456
No. Above MDL	426	218	456
Arithmetic Mean	118.68	76.86	94.67
Standard Deviation	28.09	36.89	30.84
Geometric Mean	115.62	67.50	90.34
Spread Factor	1.25	1.72	1.35
Median Value	110.0	70.0	90.0
90% Less Than	160.0	130.0	135.0

TABLE F-10
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES

(Note: Analysis for compounds by Acid w/ methylation
and by CLS GCMS began on 1 December, 1981)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Chloroform: LLE ECD			
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)			
No. of Samples	171	187	253
No. Detected	166	163	250
No. Above MDL	166	149	250
Arithmetic Mean	2.73	0.83	1.89
Standard Deviation	1.33	0.53	1.13
Geometric Mean	2.45	0.67	1.68
Spread Factor	1.70	2.12	1.60
Median Value	2.6	0.8	1.7
90% Less Than	3.8	1.6	2.6
Chloroform: LLE ECD [grab samples]			
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)			
No. of Samples			60 (*)
No. Detected			60
No. Above MDL			39
Arithmetic Mean			0.84
Standard Deviation			0.68
Geometric Mean			0.52
Spread Factor			2.93
Median Value			0.6
90% Less Than			1.7
Chloroform: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	28	25	40
No. Above MDL	28	23	40
Arithmetic Mean	2.22	0.68	1.66
Standard Deviation	0.87	0.57	0.78
Geometric Mean	2.06	0.48	1.53
Spread Factor	1.48	2.52	1.49
Median Value	2.2	0.7	1.5
90% Less Than	3.7	1.5	2.2
Maximum Value	4.1	2.5	4.5
Bromodichloromethane: LLE ECD			
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)			
No. of Samples	171	187	253
No. Detected	167	170	250
No. Above MDL	115	114	164
Arithmetic Mean	0.36	0.42	0.38
Standard Deviation	0.68	0.28	0.25
Geometric Mean	0.31	0.36	0.34
Spread Factor	1.54	1.86	1.64
Median Value	0.3	0.3	0.3
90% Less Than	0.5	0.8	0.6
Bromodichloromethane: LLE ECD [grab samples]			
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)			
No. of Samples			60 (*)
No. Detected			59
No. Above MDL			24
Arithmetic Mean			0.30
Standard Deviation			0.18
Geometric Mean			0.25
Spread Factor			1.74
Median Value			NQ
90% Less Than			0.5

TABLE F-10
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Bromodichloromethane: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	15	9	27
No. Above MDL	11	8	20
Arithmetic Mean	0.23	0.13	0.22
Standard Deviation	0.34	0.12	0.23
Geometric Mean	0.15	0.14	0.18
Spread Factor	2.55	1.83	1.98
Median Value	NQ	ND	NQ
90% Less Than	0.4	0.3	0.4
Maximum Value	1.8	0.4	1.1
Bromodichloromethane: CLS GCMS			
(IDL= 0.001 ug/l;MDL= 0.070 ug/l)			
No. of Samples	27	26	29
No. Detected	26	24	29
No. Above MDL	20	21	26
Arithmetic Mean	0.6290	0.2841	0.2797
Standard Deviation	1.4339	0.3563	0.3647
Geometric Mean	0.1666	0.1767	0.1850
Spread Factor	4.73	2.70	2.38
Median Value	0.150	0.190	0.180
90% Less Than	2.700	0.570	0.500
Maximum Value	6.800	1.700	2.000
Dibromochloromethane: LLE ECD			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	171	187	253
No. Detected	145	154	214
No. Above MDL	28	98	106
Arithmetic Mean	0.17	0.24	0.19
Standard Deviation	0.18	0.19	0.16
Geometric Mean	0.08	0.20	0.17
Spread Factor	2.53	1.92	1.69
Median Value	NQ	0.2	NQ
90% Less Than	0.2	0.5	0.3
Dibromochloromethane: LLE ECD [grab samples]			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples			60 (*)
No. Detected			50
No. Above MDL			7
Arithmetic Mean			0.16
Standard Deviation			0.14
Median Value			NQ
90% Less Than			0.2
Dibromochloromethane: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)			
No. of Samples	28	29	40
No. Detected	3	3	9
No. Above MDL	0	0	1
Arithmetic Mean	NQ	NQ	0.11
Standard Deviation			0.16
Median Value	ND	ND	ND
90% Less Than	NQ	NQ	NQ
Maximum Value	NQ	NQ	1.0

TABLE F-10
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Dibromochloromethane: CLS GCMS			
(IDL= 0.001 ug/l;MDL= 0.050 ug/l)			
No. of Samples	27	26	29
No. Detected	26	26	29
No. Above MDL	13	17	21
Arithmetic Mean	0.1281	0.2261	0.1522
Standard Deviation	0.2830	0.4058	0.1848
Geometric Mean	0.0473	0.0863	0.0959
Spread Factor	3.95	4.01	2.66
Median Value	NQ	0.080	0.100
90% Less Than	0.250	0.540	0.450
Maximum Value	1.500	1.600	0.920
Bromoform: LLE ECD			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	171	187	253
No. Detected	7	22	25
No. Above MDL	5	12	13
Arithmetic Mean	0.06	0.08	0.07
Standard Deviation	0.04	0.16	0.08
Median Value	ND	ND	ND
90% Less Than	ND	NQ	ND
Bromoform: LLE ECD (grab samples)			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples			60 (*)
No. Detected			11
No. Above MDL			1
Arithmetic Mean			0.07
Standard Deviation			0.07
Median Value			ND
90% Less Than			NQ
Bromoform: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.6 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	1
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	NQ
Bromoform: CLS GCMS			
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)			
No. of Samples	27	26	29
No. Detected	3	12	15
No. Above MDL	0	4	4
Arithmetic Mean	NQ	0.0758	0.0364
Standard Deviation		0.2737	0.1030
Geometric Mean		0.0020	
Spread Factor		19.42	
Median Value	ND	ND	NQ
90% Less Than	NQ	0.077	0.062
Maximum Value	NQ	1.400	0.560

TABLE F-10
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Dichloroiodomethane: LLE ECD			
(IDL= 0.5 ug/l;MDL= 0.5 ug/l)			
No. of Samples	21	20	85
No. Detected	0	0	3
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Dichloroiodomethane: LLE ECD [grab samples]			
(IDL= 0.5 ug/l;MDL= 0.5 ug/l)			
No. of Samples			4 (*)
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Dichloroiodomethane: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Total Trihalomethanes: LLE ECD			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	171	186	252
No. Detected	167	176	251
No. Above MDL	167	164	251
Arithmetic Mean	3.23	1.46	2.43
Standard Deviation	1.98	1.00	1.37
Geometric Mean	2.82	1.03	2.17
Spread Factor	1.83	2.71	1.60
Median Value	3.0	1.4	2.2
90% Less Than	4.4	2.8	3.4
Total Trihalomethanes: LLE ECD [grab samples]			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples			60 (*)
No. Detected			60
No. Above MDL			51
Arithmetic Mean			1.13
Standard Deviation			0.93
Geometric Mean			0.73
Spread Factor			2.84
Median Value			0.9
90% Less Than			2.5

TABLE F-10
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Bromochloromethane: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.6 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Bromomethane: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Carbon Tetrachloride: LLE ECD			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	171	187	253
No. Detected	13	9	44
No. Above MDL	1	1	4
Arithmetic Mean	0.06	0.06	0.07
Standard Deviation	0.04	0.02	0.05
Median Value	ND	ND	ND
90% Less Than	ND	ND	NQ
Carbon Tetrachloride: LLE ECD [grab samples]			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples			60 (*)
No. Detected			44
No. Above MDL			5
Arithmetic Mean			0.13
Standard Deviation			0.05
Median Value			NQ
90% Less Than			NQ
Carbon Tetrachloride: purge & trap GCMS			
(IDL= 0.3 ug/l;MDL= 0.5 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	1
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	NQ

TABLE F-10
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Chloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Dichlorodifluoromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Dichloromethane (Methylene chloride): purge & trap GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)			
No. of Samples	28	29	40
No. Detected	4	3	4
No. Above MDL	2	0	1
Arithmetic Mean	0.29	NQ	0.20
Standard Deviation	0.64		0.53
Median Value	ND	ND	ND
90% Less Than	NQ	NQ	ND
Maximum Value	2.6	NQ	3.0
Iodoform: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Trichlorofluoromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)			
No. of Samples	28	29	40
No. Detected	3	7	10
No. Above MDL	1	2	4
Arithmetic Mean	0.08	0.13	0.44
Standard Deviation	0.08	0.18	1.25
Median Value	ND	ND	ND
90% Less Than	NQ	NQ	NQ
Maximum Value	0.4	0.8	5.8

TABLE F-10
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Chloroethane: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,2-Dibromoethane: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,2-Dibromoethane: CLS GCMS			
(IDL= 0.002 ug/l;MDL= 0.050 ug/l)			
No. of Samples	27	26	29
No. Detected	1	3	1
No. Above MDL	0	1	0
Arithmetic Mean	NQ	0.0102	NQ
Standard Deviation		0.0373	
Median Value	ND	ND	ND
90% Less Than	ND	NQ	ND
Maximum Value	NQ	0.1900	NQ
1,1-Dichloroethane: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.6 ug/l)			
No. of Samples	28	29	40
No. Detected	2	1	2
No. Above MDL	0	0	0
Arithmetic Mean	NQ	NQ	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	NQ	NQ	NQ
1,2-Dichloroethane: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)			
No. of Samples	28	29	40
No. Detected	1	0	0
No. Above MDL	0	0	0
Arithmetic Mean	NQ	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	NQ	ND	ND

TABLE F-10
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Hexachloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Hexachloroethane: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.050 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Hexachloroethane: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 7.5 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,1,2,2-Tetrachloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,1,2,2-Tetrachloroethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)			
No. of Samples	27	26	29
No. Detected	3	2	2
No. Above MDL	2	0	1
Arithmetic Mean	0.0362	NQ	0.0038
Standard Deviation	0.1654		0.0137
Median Value	ND	ND	ND
90% Less Than	NQ	ND	ND
Maximum Value	0.860	NQ	0.071

TABLE F-10
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1,1,1-Trichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	20	8	25
No. Above MDL	13	4	12
Arithmetic Mean	0.36	0.11	0.16
Standard Deviation	0.68	0.15	0.14
Geometric Mean	0.18		0.13
Spread Factor	3.07		1.97
Median Value	NQ	ND	NQ
90% Less Than	0.6	0.3	0.3
Maximum Value	3.7	0.8	0.7
1,1,2-Trichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,1,2-Trichloroethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.070 ug/l)			
No. of Samples	27	26	29
No. Detected	10	2	5
No. Above MDL	0	0	0
Arithmetic Mean	NQ	NQ	NQ
Median Value	ND	ND	ND
90% Less Than	NQ	ND	NQ
Maximum Value	NQ	NQ	NQ
1,2-Dibromo-3-chloropropane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,2-Dichloropropane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	2	0	1
No. Above MDL	2	0	0
Arithmetic Mean	0.08	ND	NQ
Standard Deviation	0.12		
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	0.6	ND	NQ

TABLE F-10
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1,2-Dichloropropane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.080 ug/l)			
No. of Samples	27	26	29
No. Detected	14	6	13
No. Above MDL	2	1	1
Arithmetic Mean	0.0445	0.0197	0.0239
Standard Deviation	0.1093	0.0594	0.0392
Median Value	NQ	ND	ND
90% Less Than	NQ	NQ	NQ
Maximum Value	0.570	0.300	0.200

TABLE F-11
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Chloroethene (Vinyl chloride): purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.3 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,1-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.5 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
cis-1,2-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l; MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
trans-1,2-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.5 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Tetrachloroethene: LLE ECD (IDL= 0.1 ug/l; MDL= 0.4 ug/l)			
No. of Samples	171	187	253
No. Detected	169	185	251
No. Above MDL	139	67	191
Arithmetic Mean	1.70	0.74	0.97
Standard Deviation	2.61	1.29	1.05
Geometric Mean	0.95	0.22	0.65
Spread Factor	2.87	4.43	2.38
Median Value	0.9	NQ	0.6
90% Less Than	4.0	1.8	2.1

TABLE F-11
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Trichloroethene: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.7 ug/l)			
No. of Samples	28	29	40
No. Detected	11	0	10
No. Above MDL	0	0	0
Arithmetic Mean	NQ	ND	NQ
Median Value	ND	ND	ND
90% Less Than	NQ	ND	NQ
Maximum Value	NQ	ND	NQ
Trichloroethene: CLS GCMS (IDL= 0.001 ug/l; MDL= 0.130 ug/l)			
No. of Samples	27	26	29
No. Detected	15	10	14
No. Above MDL	15	9	14
Arithmetic Mean	0.1865	0.0351	0.0896
Standard Deviation	0.3036	0.0503	0.1525
Geometric Mean	0.0969		0.0583
Spread Factor	3.62		3.14
Median Value	0.060	ND	ND
90% Less Than	0.540	0.120	0.350
Maximum Value	1.100	0.150	0.630
cis-1,2-Dichloropropene: Purge & trap GCMS (IDL= 0.1 ug/l; MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
cis-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.1 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
trans-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-11
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Tetrachloroethene: LLE ECD [grab samples] (IDL= 0.1 ug/l;MDL= 0.4 ug/l)			
No. of Samples			60 (*)
No. Detected			60
No. Above MDL			47
Arithmetic Mean			1.15
Standard Deviation			1.02
Geometric Mean			0.77
Spread Factor			2.53
Median Value			0.7
90% Less Than			3.0
Tetrachloroethene: purge & trap GCMS (IDL= 0.2 ug/l;MDL= 0.5 ug/l)			
No. of Samples	28	29	40
No. Detected	28	25	36
No. Above MDL	23	10	27
Arithmetic Mean	1.98	0.54	1.00
Standard Deviation	1.94	0.57	0.94
Geometric Mean	1.24	0.34	0.71
Spread Factor	2.76	2.39	2.35
Median Value	1.1	NQ	0.6
90% Less Than	4.7	1.3	2.0
Maximum Value	7.4	3.0	4.2
Tetrachloroethene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.020 ug/l)			
No. of Samples	27	26	29
No. Detected	26	23	28
No. Above MDL	26	22	28
Arithmetic Mean	2.5154	0.3227	1.3674
Standard Deviation	4.2734	0.2546	1.8189
Geometric Mean	0.9032	0.1848	0.6972
Spread Factor	4.64	3.91	3.43
Median Value	0.950	0.300	0.590
90% Less Than	7.900	0.680	5.000
Maximum Value	20.000	0.870	7.000
Trichloroethene: LLE ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)			
No. of Samples	171	187	253
No. Detected	120	42	112
No. Above MDL	37	6	14
Arithmetic Mean	0.23	0.09	0.13
Standard Deviation	0.24	0.10	0.12
Geometric Mean	0.14		
Spread Factor	2.48		
Median Value	NQ	ND	ND
90% Less Than	0.4	NQ	NQ
Trichloroethene: LLE ECD [grab samples] (IDL= 0.1 ug/l;MDL= 0.3 ug/l)			
No. of Samples			60 (*)
No. Detected			32
No. Above MDL			4
Arithmetic Mean			0.19
Standard Deviation			0.28
Median Value			NQ
90% Less Than			NQ

TABLE F-11
CHARACTERIZATION OF INFLUENTS — 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS — HALOGENATED ALKENES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Hexachlorobutadiene: purge & trap GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Hexachlorobutadiene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Hexachlorobutadiene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=12.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981; Analysis for compounds by Acid without methylation was terminated on 31 November, 1981)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Benzene: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)			
No. of Samples	28	29	40
No. Detected	0	1	0
No. Above MDL	0	1	0
Arithmetic Mean	ND	0.05	ND
Standard Deviation		0.01	
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	0.1	ND
Ethenylbenzene: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	1	1
No. Above MDL	0	0	0
Arithmetic Mean	ND	NQ	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	NQ	NQ
Ethenylbenzene: CLS GCMS			
(IDL= 0.005 ug/l;MDL= 0.020 ug/l)			
No. of Samples	27	26	29
No. Detected	17	17	15
No. Above MDL	6	10	9
Arithmetic Mean	0.0147	0.0279	0.0220
Standard Deviation	0.0166	0.0414	0.0337
Geometric Mean	0.0095	0.0137	0.0106
Spread Factor	2.63	3.47	3.69
Median Value	NQ	NQ	NQ
90% Less Than	0.038	0.089	0.110
Maximum Value	0.071	0.170	0.120
Ethylbenzene: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)			
No. of Samples	28	29	40
No. Detected	1	2	0
No. Above MDL	0	0	0
Arithmetic Mean	NQ	NQ	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	NQ	NQ	ND
Ethylbenzene: CLS GCMS			
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)			
No. of Samples	27	26	29
No. Detected	11	12	14
No. Above MDL	4	8	5
Arithmetic Mean	0.0248	0.0332	0.0286
Standard Deviation	0.0473	0.0595	0.0511
Geometric Mean		0.0235	0.0092
Spread Factor		2.79	4.86
Median Value	ND	ND	ND
90% Less Than	0.088	0.089	0.075
Maximum Value	0.220	0.290	0.200

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Propylbenzene: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Propylbenzene: CLS GCMS			
(IDL= 0.001 ug/l;MDL= 0.010 ug/l)			
No. of Samples	27	26	29
No. Detected	9	14	12
No. Above MDL	3	11	6
Arithmetic Mean	0.0070	0.0134	0.0072
Standard Deviation	0.0181	0.0188	0.0141
Geometric Mean		0.0085	0.0032
Spread Factor		3.14	4.12
Median Value	ND	NQ	ND
90% Less Than	0.010	0.030	0.018
Maximum Value	0.071	0.084	0.067
Toluene: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)			
No. of Samples	28	29	40
No. Detected	0	3	5
No. Above MDL	0	3	5
Arithmetic Mean	ND	0.09	0.12
Standard Deviation		0.11	0.22
Median Value	ND	ND	ND
90% Less Than	ND	0.3	0.2
Maximum Value	ND	0.5	1.2
Toluene: CLS GCMS			
(IDL= 0.020 ug/l;MDL= 0.090 ug/l)			
No. of Samples	27	26	29
No. Detected	14	14	14
No. Above MDL	12	12	10
Arithmetic Mean	0.0882	0.1025	0.0892
Standard Deviation	0.1061	0.1276	0.1340
Geometric Mean	0.0802	0.0829	0.0583
Spread Factor	2.17	2.39	2.94
Median Value	NQ	NQ	ND
90% Less Than	0.210	0.260	0.310
Maximum Value	0.440	0.540	0.600
1,2-Xylene: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)			
No. of Samples	28	29	40
No. Detected	1	2	0
No. Above MDL	0	2	0
Arithmetic Mean	NQ	0.05	ND
Standard Deviation		0.01	
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	NQ	0.1	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1,2-Xylene: CLS GCMS			
(IDL= 0.005 ug/l;MDL= 0.030 ug/l)			
No. of Samples	27	26	29
No. Detected	11	14	15
No. Above MDL	2	11	6
Arithmetic Mean	0.0247	0.0412	0.0299
Standard Deviation	0.0623	0.0570	0.0577
Geometric Mean		0.0252	0.0072
Spread Factor		3.19	5.94
Median Value	ND	NQ	NQ
90% Less Than	NQ	0.099	0.080
Maximum Value	0.280	0.230	0.270
1,3-Xylene/1,4-Xylene: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)			
No. of Samples	28	29	40
No. Detected	2	2	2
No. Above MDL	1	0	0
Arithmetic Mean	0.09	NQ	NQ
Standard Deviation	0.18		
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	1.0	NQ	NQ
1,3-Xylene/1,4-Xylene: CLS GCMS			
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)			
No. of Samples	27	26	29
No. Detected	9	13	14
No. Above MDL	3	9	7
Arithmetic Mean	0.0138	0.0410	0.0310
Standard Deviation	0.0207	0.0861	0.0591
Geometric Mean		0.0252	0.0169
Spread Factor		2.92	3.33
Median Value	ND	ND	ND
90% Less Than	0.041	0.079	0.090
Maximum Value	0.080	0.440	0.300
Nitrobenzene: Base neut. LLE GCMS			
(IDL= 0.5 ug/l;MDL= 2.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1-Methyl-2,4-dinitrobenzene: Base neut. LLE GCMS			
(IDL= 1.0 ug/l;MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1-Methyl-2,6-Dinitrobenzene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Benzylbutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL= 7.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Bis(2-ethylhexyl)phthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)			
No. of Samples	11	11	22
No. Detected	0	0	1
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	NQ
Di-n-Butylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 9.0 ug/l)			
No. of Samples	16	16	27
No. Detected	1	0	1
No. Above MDL	0	0	0
Arithmetic Mean	NQ	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	NQ	ND	NQ
Dicyclohexylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Diethylphthalate: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 9.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	1
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	NQ
Diisobutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Dimethylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL=10.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Dioctylphthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Diphenylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Phenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
Phenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)			
No. of Samples	13	14	14
No. Detected	2	0	1
No. Above MDL	0	0	0
Arithmetic Mean	NQ	ND	NQ
Median Value	ND	ND	ND
90% Less Than	NQ	ND	ND
Maximum Value	NQ	ND	NQ
2,4-Dimethylphenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
2,4-Dimethylphenol: Acid LLE (w/ methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2,4-Dinitrophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
2,4-Dinitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2-Methyl-4,6-dinitrophenol: Acid LLE (w/o methyl.) GCMS (IDL=10.0 ug/l;MDL=NA ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
2-Methyl-4,6-dinitrophenol: Acid LLE (w/ methyl.) GCMS (IDL=10.0 ug/l;MDL=NA ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2-Nitrophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
2-Nitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
4-Nitrophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
4-Nitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Acenaphthene: CLS GCMS (IDL= 0.010 ug/l;MDL=NA ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Acenaphthene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 3.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Acenaphthylene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)			
No. of Samples	11	11	22
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Napthalene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Napthalene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.040 ug/l)			
No. of Samples	27	26	29
No. Detected	5	9	5
No. Above MDL	1	2	1
Arithmetic Mean	0.0093	0.0143	0.0103
Standard Deviation	0.0095	0.0153	0.0151
Median Value	ND	ND	ND
90% Less Than	NQ	NQ	NQ
Maximum Value	0.040	0.062	0.080
Napthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Anthracene: CLS GCMS (IDL= 0.050 ug/l;MDL= 0.090 ug/l)			
No. of Samples	27	26	29
No. Detected	0	1	0
No. Above MDL	0	1	0
Arithmetic Mean	ND	0.0311	ND
Standard Deviation		0.0310	
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	0.183	ND
Anthracene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 6.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Benzidine: Base neut. LLE GCMS (IDL=50.0 ug/l;MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Benzo(a)anthracene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Benzo(b)fluoranthene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Benzo(k)fluoranthene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Benzo(g,h,i)perylene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=20.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Benzo(a)pyrene: Base neut. LLE GCMS			
(IDL= 1.0 ug/l;MDL=10.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Chrysene: Base neut. LLE GCMS			
(IDL= 1.0 ug/l;MDL= 6.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Dibenzo(a,h)anthracene: Base neut. LLE GCMS			
(IDL= 1.0 ug/l;MDL= 9.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
3,3'-Dichlorobenzidine: Base neut. LLE GCMS			
(IDL= 5.0 ug/l;MDL= 8.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,2-Diphenylhydrazine/Azobenzene: Base neut. LLE GCMS			
(IDL= 0.5 ug/l;MDL= 7.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1,2-Diphenylhydrazine/Azobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.100 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Fluoranthene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)			
No. of Samples	11	11	22
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Fluorene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 3.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Fluorene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.080 ug/l)			
No. of Samples	27	26	29
No. Detected	2	3	1
No. Above MDL	0	1	0
Arithmetic Mean	NQ	0.0137	NQ
Standard Deviation		0.0299	
Median Value	ND	ND	ND
90% Less Than	ND	NQ	ND
Maximum Value	NQ	0.150	NQ
Indeno(1,2,3-cd)pyrene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=30.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-12
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Phenanthrene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Phenanthrene: CLS GCMS (IDL= 0.050 ug/l;MDL= 0.120 ug/l)			
No. of Samples	27	26	29
No. Detected	0	1	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	NQ	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	NQ	ND
Pyrene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)			
No. of Samples	11	11	22
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981; Analysis for compounds by Acid without methylation was terminated on 31 November, 1981)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Bromobenzene: purge & trap GCMS (IDL= 0.1 ug/l; MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Bromobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l; MDL= 4.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Bromobenzene: CLS GCMS (IDL= 0.001 ug/l; MDL= 0.020 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	1
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	NQ
Chlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	1
No. Above MDL	0	0	1
Arithmetic Mean	ND	ND	0.09
Standard Deviation			0.23
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	1.5
Chlorobenzene: CLS GCMS (IDL= 0.005 ug/l; MDL= 0.020 ug/l)			
No. of Samples	27	26	29
No. Detected	1	1	1
No. Above MDL	0	1	0
Arithmetic Mean	NQ	0.0032	NQ
Standard Deviation		0.0034	
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	NQ	0.020	NQ

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
4-Chloro-1-methylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
4-Chloro-1-methylbenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)			
No. of Samples	27	26	29
No. Detected	1	3	3
No. Above MDL	1	1	1
Arithmetic Mean	0.0064	0.0282	0.0044
Standard Deviation	0.0307	0.1371	0.0172
Median Value	ND	ND	ND
90% Less Than	ND	NQ	NQ
Maximum Value	0.160	0.700	0.093
1,2-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	17	5	19
No. Above MDL	13	2	9
Arithmetic Mean	0.18	0.09	0.13
Standard Deviation	0.14	0.14	0.12
Geometric Mean	0.18		0.12
Spread Factor	1.68		1.89
Median Value	NQ	ND	ND
90% Less Than	0.4	NQ	0.3
Maximum Value	0.5	0.8	0.6
1,2-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)			
No. of Samples	16	16	27
No. Detected	1	0	2
No. Above MDL	1	0	0
Arithmetic Mean	0.33	ND	NQ
Standard Deviation	1.11		
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	4.5	ND	NQ
1,2-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)			
No. of Samples	27	26	29
No. Detected	26	21	29
No. Above MDL	23	4	26
Arithmetic Mean	0.1339	0.0144	0.0766
Standard Deviation	0.1148	0.0191	0.1012
Geometric Mean	0.0908	0.0047	0.0530
Spread Factor	2.73	4.22	2.20
Median Value	0.110	NQ	0.049
90% Less Than	0.310	0.027	0.140
Maximum Value	0.460	0.077	0.560

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1,3-Dichlorobenzene: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	7	1	10
No. Above MDL	1	0	0
Arithmetic Mean	0.08	NQ	NQ
Standard Deviation	0.05		
Median Value	ND	ND	ND
90% Less Than	NQ	ND	NQ
Maximum Value	0.2	NQ	NQ
1,3-Dichlorobenzene: Base neut. LLE GCMS			
(IDL= 0.1 ug/l;MDL= 4.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	1
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	NQ
1,3-Dichlorobenzene: CLS GCMS			
(IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)			
No. of Samples	27	26	29
No. Detected	26	19	29
No. Above MDL	19	8	18
Arithmetic Mean	0.1133	0.0154	0.0553
Standard Deviation	0.1568	0.0162	0.0841
Geometric Mean	0.0447	0.0139	0.0277
Spread Factor	4.36	2.16	3.20
Median Value	0.050	NQ	0.030
90% Less Than	0.360	0.039	0.140
Maximum Value	0.610	0.059	0.370
1,4-Dichlorobenzene: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	8	3	10
No. Above MDL	4	1	2
Arithmetic Mean	0.11	0.06	0.09
Standard Deviation	0.12	0.04	0.09
Median Value	ND	ND	ND
90% Less Than	0.3	NQ	NQ
Maximum Value	0.5	0.2	0.6
1,4-Dichlorobenzene: Base neut. LLE GCMS			
(IDL= 0.1 ug/l;MDL= 6.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	1
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	NQ

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1,4-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)			
No. of Samples	27	26	29
No. Detected	25	22	28
No. Above MDL	22	8	23
Arithmetic Mean	0.1437	0.0193	0.0796
Standard Deviation	0.2311	0.0221	0.1348
Geometric Mean	0.0642	0.0122	0.0416
Spread Factor	3.64	2.79	2.92
Median Value	0.060	NQ	0.038
90% Less Than	0.310	0.046	0.190
Maximum Value	1.100	0.098	0.710
Hexachlorobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 2.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Hexachlorobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.050 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1-Chloro-2-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1-Chloro-3-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1-Chloro-4-nitrobenzene: Base neut. LLE GCMS			
(IDL= 5.0 ug/l:MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,2,3-Trichlorobenzene: purge & trap GCMS			
(IDL= 0.1 ug/l:MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,2,3-Trichlorobenzene: CLS GCMS			
(IDL= 0.001 ug/l:MDL= 0.030 ug/l)			
No. of Samples	27	26	29
No. Detected	12	6	8
No. Above MDL	0	0	1
Arithmetic Mean	NQ	NQ	0.0062
Standard Deviation			0.0124
Median Value	ND	ND	ND
90% Less Than	NQ	NQ	NQ
Maximum Value	NQ	NQ	0.061
1,2,4-Trichlorobenzene: purge & trap GCMS			
(IDL= 0.1 ug/l:MDL= 0.5 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,2,4-Trichlorobenzene: Base neut. LLE GCMS			
(IDL= 0.1 ug/l:MDL= 8.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1,2,4-Trichlorobenzene: CLS GCMS			
(IDL= 0.001 ug/l;MDL= 0.020 ug/l)			
No. of Samples	27	26	29
No. Detected	19	7	13
No. Above MDL	9	1	4
Arithmetic Mean	0.0203	0.0040	0.0074
Standard Deviation	0.0232	0.0071	0.0096
Geometric Mean	0.0134		
Spread Factor	2.92		
Median Value	NQ	ND	ND
90% Less Than	0.055	NQ	0.028
Maximum Value	0.080	0.032	0.031
1,3,5-Trichlorobenzene: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL= 0.5 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,3,5-Trichlorobenzene: CLS GCMS			
(IDL= 0.001 ug/l;MDL= 0.020 ug/l)			
No. of Samples	27	26	29
No. Detected	0	1	3
No. Above MDL	0	0	0
Arithmetic Mean	ND	NQ	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	NQ
Maximum Value	ND	NQ	NQ
2-Chlorophenol: Acid LLE (w/o methyl.) GCMS			
(IDL= 0.5 ug/l;MDL= 5.0 ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
2-Chlorophenol: Acid LLE (w/ methyl.) GCMS			
(IDL= 1.0 ug/l;MDL= 8.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
2-Chloro-3-methylphenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l:MDL=NA ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
2-Chloro-3-methylphenol: Acid LLE Methyl GCMS (IDL= 5.0 ug/l:MDL=NA ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
3-Chlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l:MDL= 4.0 ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
3-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL=NA ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
4-Chlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l:MDL=NA ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
4-Chlorophenol: Acid LLE (w/ methyl.) GCMS			
(IDL= 1.0 ug/l:MDL= 9.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
4-Chloro-3-methylphenol: Acid LLE (w/o methyl.) GCMS			
(IDL= 0.5 ug/l:MDL= 5.0 ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
4-Chloro-3-methylphenol: Acid LLE (w/ methyl.) GCMS			
(IDL= 1.0 ug/l:MDL= 7.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2,4-Dichlorophenol: Acid LLE (w/o methyl.) GCMS			
(IDL= 0.5 ug/l:MDL= 6.0 ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
2,4-Dichlorophenol: Acid LLE (w/ methyl.) GCMS			
(IDL= 1.0 ug/l:MDL= 7.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Pentachlorophenol: Acid LLE (w/o methyl.) GCMS			
(IDL= 5.0 ug/l;MDL=30.0 ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
Pentachlorophenol: Acid LLE (w/ methyl.) GCMS			
(IDL= 1.0 ug/l;MDL= 4.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2,3,5-Trichlorophenol: Acid LLE (w/o methyl.) GCMS			
(IDL= 0.5 ug/l;MDL= 8.0 ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
2,3,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS			
(IDL= 1.0 ug/l;MDL= 7.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2,3,6-Trichlorophenol: Acid LLE (w/o methyl.) GCMS			
(IDL= 0.5 ug/l;MDL= 7.0 ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
2,3,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2,4,5-Trichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 6.0 ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
2,4,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2,4,6-Trichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 7.0 ug/l)			
No. of Samples			11
No. Detected			0
No. Above MDL			0
Arithmetic Mean			ND
Median Value			ND
90% Less Than			ND
Maximum Value			ND
2,4,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)			
No. of Samples	13	14	14
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l;MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1-Chloronaphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1-Chloronaphthalene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l;MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2-Chloronaphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 9.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
2-Chloronaphthalene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Arochlor 1016: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Arochlor 1221: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Arochlor 1232: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Arochlor 1242: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-13
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Arochlor 1248: LLE ECD			
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Arochlor 1254: LLE ECD			
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Arochlor 1260: LLE ECD			
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-14
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES

(Note: Analysis for compounds by Acid w/ methylation
and by CLS GCMS began on 1 December, 1981)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Aldrin: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)			
No. of Samples	10	11	20
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Atrazine: Base neut. LLE GCMS			
(IDL= 5.0 ug/l;MDL= 9.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Alpha-BHC: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.20 ug/l)			
No. of Samples	15	16	25
No. Detected	1	2	1
No. Above MDL	0	0	0
Arithmetic Mean	NQ	NQ	NQ
Median Value	ND	ND	ND
90% Less Than	ND	NQ	ND
Maximum Value	NQ	NQ	NQ
Beta-BHC: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.20 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Delta-BHC: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-14
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Gamma-BHC: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.02 ug/l)			
No. of Samples	15	16	25
No. Detected	7	1	7
No. Above MDL	7	0	7
Arithmetic Mean	0.036	NQ	0.019
Standard Deviation	0.038		0.031
Geometric Mean	0.020		0.009
Spread Factor	3.64		3.65
Median Value	ND	ND	ND
90% Less Than	0.09	ND	0.04
Maximum Value	0.11	NQ	0.15
Chlordane: LLE ECD			
(IDL= 0.01 ug/l;MDL=NA ug/l)			
No. of Samples	10	11	20
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
4,4'-DDD: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
4,4'-DDE: LLE ECD			
(IDL= 0.01 ug/l;MDL= 1.00 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
4,4'-DDT: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.09 ug/l)			
No. of Samples	15	16	25
No. Detected	0	1	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	NQ	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	NQ	ND

TABLE F-14
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Dieldrin: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)			
No. of Samples	10	11	20
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Endrin: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.07 ug/l)			
No. of Samples	10	11	20
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Endosulfan I: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)			
No. of Samples	15	16	25
No. Detected	6	0	4
No. Above MDL	3	0	0
Arithmetic Mean	0.016	ND	NQ
Standard Deviation	0.016		
Geometric Mean	0.019		
Spread Factor	1.73		
Median Value	ND	ND	ND
90% Less Than	0.04	ND	NQ
Maximum Value	0.05	ND	NQ
Endosulfan II: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Endosulfan sulfate: LLE ECD			
(IDL= 0.01 ug/l;MDL= 0.02 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	1
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	NQ

TABLE F-14
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Heptachlor: LLE ECD (IDL= 0.01 ug/l:MDL= 0.20 ug/l)			
No. of Samples	10	11	20
No. Detected	1	0	0
No. Above MDL	0	0	0
Arithmetic Mean	NQ	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	NQ	ND	ND
Heptachlor epoxide: LLE ECD (IDL= 0.01 ug/l:MDL= 0.10 ug/l)			
No. of Samples	10	11	20
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Hexachlorocyclopentadiene: Base neut. LLE GCMS (IDL= 1.0 ug/l:MDL=20.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Hexachlorocyclopentadiene: CLS GCMS (IDL= 0.010 ug/l:MDL= 0.340 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Kepone: LLE E[illegible] (IDL= 0.01 [illegible] /l:MDL= 2.00 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-14
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
Methoxychlor: LLE ECD			
(IDL= 0.01 ug/l:MDL= 0.09 ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Toxaphene: LLE ECD			
(IDL= 0.01 ug/l:MDL=NA ug/l)			
No. of Samples	15	16	25
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2,3,7,8-Tetrachlorodibenzo-p-dioxin: Base neut. LLE GCMS			
(IDL=10.0 ug/l:MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Tricresolphosphate: Base neut. LLE GCMS			
(IDL=50.0 ug/l:MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2,4-D: LLE (w/ methyl.) ECD			
(IDL= 0.1 ug/l:MDL= 0.1 ug/l)			
No. of Samples	12	13	24
No. Detected	1	1	1
No. Above MDL	1	1	1
Arithmetic Mean	0.06	0.06	0.05
Standard Deviation	0.05	0.04	0.02
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	0.2	0.2	0.2

TABLE F-14
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
2,4,5-T: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l; MDL= 0.3 ug/l)			
No. of Samples	12	13	24
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2,4,5-TP: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l; MDL= 0.5 ug/l)			
No. of Samples	12	13	24
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-15
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS

(Note: Analysis for compounds by Acid w/ methylation
and by CLS GCMS began on 1 December, 1981)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
N-Nitrosodimethylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l:MDL=10.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
N-Nitrosodiphenylamine: Base neut. LLE GCMS (IDL= 0.1 ug/l:MDL= 5.0 ug/l)			
No. of Samples	11	11	22
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
N-Nitrosodipropylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l:MDL= 3.0 ug/l)			
No. of Samples	11	11	22
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1-Bromo-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l:MDL= 5.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1-Bromo-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l:MDL= 0.030 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-15
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1-Chloro-4-phenoxybenzene: Base neut. LLE GCMS			
(IDL= 0.5 ug/l;MDL= 8.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1-Chloro-4-phenoxybenzene: CLS GCMS			
(IDL= 0.001 ug/l;MDL= 0.030 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2-Chloroethylvinylether: purge & trap GCMS			
(IDL= 0.1 ug/l;MDL=NA ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2-Chloroethylvinylether: Base neut. LLE GCMS			
(IDL= 1.0 ug/l;MDL=NA ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,1'-(Methylenebis(oxy))-bis-2-chloroethane: Base neut. LLE GCMS			
(IDL= 0.5 ug/l;MDL= 3.0 ug/l)			
No. of Samples	11	11	22
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND

TABLE F-15
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
1,1'-Oxybis(2-chloroethane): Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 4.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
1,1'-Oxybis(2-chloroethane): CLS GCMS (IDL= 0.005 ug/l;MDL= 0.080 ug/l)			
No. of Samples	27	26	29
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
2,2'-Oxybis(2-chloropropane): Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Tetrahydrofuran: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)			
No. of Samples	28	29	40
No. Detected	4	1	9
No. Above MDL	4	1	8
Arithmetic Mean	0.66	0.11	0.31
Standard Deviation	2.29	0.32	0.66
Geometric Mean			0.02
Spread Factor			14.04
Median Value	ND	ND	ND
90% Less Than	1.8	ND	1.1
Maximum Value	12.0	1.8	3.4
Acetone: purge & trap GCMS (IDL= 0.5 ug/l;MDL= 0.5 ug/l)			
No. of Samples	28	29	40
No. Detected	4	6	2
No. Above MDL	4	6	2
Arithmetic Mean	2.22	1.03	0.94
Standard Deviation	6.84	2.37	4.08
Geometric Mean		0.06	
Spread Factor		14.40	
Median Value	ND	ND	ND
90% Less Than	4.1	3.2	ND
Maximum Value	33.0	12.0	26.0

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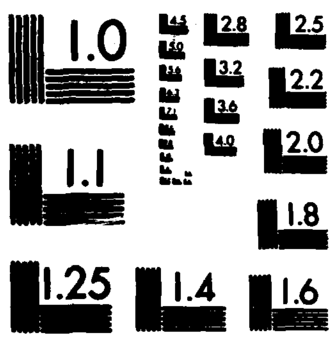

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TABLE F-15
CHARACTERIZATION OF INFLUENTS -- 16 MARCH 1981 TO 1 FEBRUARY 1983
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blue Plains Nitrified Effluent (**)	Potomac River Estuary (**)	EEWTP Blend Tank
2-Butanone: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 1.0 ug/l)			
No. of Samples	28	29	40
No. Detected	0	0	1
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	NQ
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	NQ
Isophorone: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 3.0 ug/l)			
No. of Samples	16	16	27
No. Detected	0	0	0
No. Above MDL	0	0	0
Arithmetic Mean	ND	ND	ND
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	ND	ND	ND
Geosmin: CLS GCMS (IDL= 0.0005 ug/l; MDL= 0.0500 ug/l)			
No. of Samples	27	26	29
No. Detected	8	13	9
No. Above MDL	0	0	0
Arithmetic Mean	NQ	NQ	NQ
Median Value	ND	ND	ND
90% Less Than	NQ	NQ	NQ
Maximum Value	NQ	NQ	NQ
Methylisoborneol: CLS GCMS (IDL= 0.0005 ug/l; MDL= 0.0400 ug/l)			
No. of Samples	27	26	29
No. Detected	2	1	0
No. Above MDL	1	0	0
Arithmetic Mean	0.0035	NQ	ND
Standard Deviation	0.0133		
Median Value	ND	ND	ND
90% Less Than	ND	ND	ND
Maximum Value	0.067	NQ	ND

TABLE F - 16
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
VOLATILE ORGANIC ANALYSIS (PURGE AND TRAP, GC/MS)
(Concentrations reported in ug/L)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES			
Halogenated Ethanes			
1,2-Dichloro-1,1,2,2-tetrafluoroethane			
No. of Times Detected / No. of Samples	1 / 29	1 / 28	1 / 40
Range of Concentrations	0.9	1.2	0.9
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)			
Alkylbenzenes			
1-Ethyl-4-methylbenzene			
No. of Times Detected / No. of Samples	0 / 29	1 / 28	0 / 40
Range of Concentrations	ND	5	ND
Methylethylbenzenes (& Methylethylbenzene isomers)			
No. of Times Detected / No. of Samples	0 / 29	2 / 28	0 / 40
Range of Concentrations	ND	NQ - 2	ND
1,2,3-Trimethylbenzene			
No. of Times Detected / No. of Samples	0 / 29	3 / 28	0 / 40
Range of Concentrations	ND	NQ - 5.5	ND
MISCELLANEOUS ORGANIC CHEMICALS			
Alcohols			
1-Butanol			
No. of Times Detected / No. of Samples	0 / 29	0 / 28	1 / 40
Range of Concentrations	ND	ND	0.1
Alkanes			
Butane			
No. of Times Detected / No. of Samples	1 / 29	0 / 28	0 / 40
Range of Concentrations	0.3	ND	ND
2,4-Dimethylpentane			
No. of Times Detected / No. of Samples	0 / 29	0 / 28	1 / 40
Range of Concentrations	ND	ND	0.1
Hexane			
No. of Times Detected / No. of Samples	2 / 29	2 / 28	4 / 40
Range of Concentrations	0.1 - 0.2	0.1	NQ - 0.1
2-Methylbutane			
No. of Times Detected / No. of Samples	5 / 29	2 / 28	5 / 40
Range of Concentrations	0.1 - 0.8	0.1 - 0.3	NQ - 0.5
2-Methylpropane			
No. of Times Detected / No. of Samples	0 / 29	1 / 28	1 / 40
Range of Concentrations	ND	0.9	1.0
Pentane			
No. of Times Detected / No. of Samples	0 / 29	0 / 28	1 / 40
Range of Concentrations	ND	ND	0.6
2,2,4-Trimethylhexane			
No. of Times Detected / No. of Samples	0 / 29	1 / 28	0 / 40
Range of Concentrations	ND	0.9	ND
2,4,4-Trimethylpentane			
No. of Times Detected / No. of Samples	2 / 29	2 / 28	2 / 40
Range of Concentrations	0.2	0.2	0.2 - 0.3
Undecane			
No. of Times Detected / No. of Samples	0 / 29	1 / 28	0 / 40
Range of Concentrations	ND	2.2	ND
Alkenes			
1-Butene			
No. of Times Detected / No. of Samples	1 / 29	0 / 28	4 / 40
Range of Concentrations	1.1	ND	NQ - 0.3
2,4,4-Trimethyl-1-pentene			
No. of Times Detected / No. of Samples	2 / 29	0 / 28	0 / 40
Range of Concentrations	0.2 - 0.4	ND	ND
Cyclic Alkanes			
Methylcyclopentane			
No. of Times Detected / No. of Samples	0 / 29	0 / 28	1 / 40
Range of Concentrations	ND	ND	NQ
Cyclic Alkenes			
1-Methyl-4-(1-methylethenyl)cyclohexene			
No. of Times Detected / No. of Samples	0 / 29	1 / 28	0 / 40
Range of Concentrations	ND	2.3	ND
Epoxides			
Oxirane			
No. of Times Detected / No. of Samples	0 / 29	0 / 28	1 / 40
Range of Concentrations	ND	ND	NQ
C4-Oxirane			
No. of Times Detected / No. of Samples	0 / 29	0 / 28	1 / 40
Range of Concentrations	ND	ND	0.9
Tetramethyl-oxirane			
No. of Times Detected / No. of Samples	1 / 29	0 / 28	0 / 40
Range of Concentrations	0.6	ND	ND

TABLE F - 16
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
VOLATILE ORGANIC ANALYSIS (PURGE AND TRAP, GC/MS)
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Ethers			
Dimethoxypropane			
No. of Times Detected / No. of Samples	1 / 29	0 / 28	1 / 40
Range of Concentrations	0.9	ND	0.4
1,1'-Dimethoxypropane			
No. of Times Detected / No. of Samples	5 / 29	1 / 28	4 / 40
Range of Concentrations	0.4 - 1.0	0.5	0.2 - 0.7
2-Methoxy-2-methylpropane			
No. of Times Detected / No. of Samples	3 / 29	0 / 28	2 / 40
Range of Concentrations	0.1 - 1	ND	0.1 - 0.2
1,1'-Oxybisethane			
No. of Times Detected / No. of Samples	16 / 29	1 / 28	19 / 40
Range of Concentrations	0.1 - 2.7	1.1	NQ - 1.7
1,1'-Oxybismethane			
No. of Times Detected / No. of Samples	1 / 29	0 / 28	1 / 40
Range of Concentrations	1.3	ND	0.6
2,2'-Oxybispropane			
No. of Times Detected / No. of Samples	9 / 29	0 / 28	13 / 40
Range of Concentrations	0.3 - 3.6	ND	NQ - 1.8
Sulfur containing organic compounds			
Carbon disulfide			
No. of Times Detected / No. of Samples	4 / 29	1 / 28	2 / 40
Range of Concentrations	0.1 - 0.4	0.3	0.2 - 0.3
Thiobismethane			
No. of Times Detected / No. of Samples	3 / 29	0 / 28	4 / 40
Range of Concentrations	0.3 - 0.5	ND	NQ - 1.5

TABLE F - 17
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
ACID EXTRACTION (W / METHYLATION) AND GC/MS
(Concentrations reported in ug/L)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)			
Alkylbenzenes			
Benzoic acid			
No. of Times Detected / No. of Samples	0 / 15	0 / 15	1 / 15
Range of Concentrations	ND	ND	7
MISCELLANEOUS ORGANIC CHEMICALS			
Organic Acids			
Decanoic acid			
No. of Times Detected / No. of Samples	1 / 15	0 / 15	0 / 15
Range of Concentrations	0.8	ND	ND
Dodecanoic acid			
No. of Times Detected / No. of Samples	6 / 15	5 / 15	4 / 15
Range of Concentrations	1 - 15	1 - 12	2 - 7
Hexadecanoic acid			
No. of Times Detected / No. of Samples	6 / 15	6 / 15	5 / 15
Range of Concentrations	0.6 - 15	0.5 - 140	0.3 - 36
9-Hexadecenoic acid			
No. of Times Detected / No. of Samples	1 / 15	0 / 15	0 / 15
Range of Concentrations	1.9	ND	ND
13,16-Octadecadienoic			
No. of Times Detected / No. of Samples	1 / 15	2 / 15	1 / 15
Range of Concentrations	3	1 - 32	2
Octadecanoic acid			
No. of Times Detected / No. of Samples	5 / 15	6 / 15	3 / 15
Range of Concentrations	1 - 10	0.2 - 50	0.2 - 18
Tetradecanoic acid			
No. of Times Detected / No. of Samples	6 / 15	6 / 15	5 / 15
Range of Concentrations	1 - 11	0.7 - 27	0.4 - 9
13-Tetradecynoic acid			
No. of Times Detected / No. of Samples	0 / 15	1 / 15	0 / 15
Range of Concentrations	ND	5	ND

TABLE F - 18
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
BASE/NEUTRAL EXTRACTION AND GC/MS
(Concentrations reported in ug/L)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)			
Phenols			
2,6-Bis(1,1-Dimethylethyl)-4-methylphenol			
No. of Times Detected / No. of Samples	1 / 16	1 / 16	1 / 27
Range of Concentrations	2.5	2.4	2.3
MISCELLANEOUS ORGANIC CHEMICALS			
Nitrogen containing compounds			
N-(3-Methylphenyl)-acetamide			
No. of Times Detected / No. of Samples	1 / 16	0 / 16	0 / 27
Range of Concentrations	1.6	ND	ND
Ethers			
1,1'-Oxybis(2-methoxy)ethane			
No. of Times Detected / No. of Samples	1 / 16	0 / 16	0 / 27
Range of Concentrations	2.1	ND	ND

TABLE F - 19
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES			
Halogenated Ethanes			
1,1,1-Trichloroethane			
No. of Times Detected / No. of Samples	5 / 27	5 / 26	5 / 29
Range of Concentrations	.25 - 2.0	.115 - 8.4	.13 - 5.5
Halogenated Alkanes (C3 or greater)			
1,2,3-Trichloropropane			
No. of Times Detected / No. of Samples	2 / 27	0 / 26	0 / 29
Range of Concentrations	.0064 - .049	ND	ND
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES			
Halogenated Alkenes (C3 or greater)			
trans-1,3-Dichloropropene			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.015 - .18	ND
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)			
Alkylbenzenes			
1,3-Diethylbenzene			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	1 / 29
Range of Concentrations	ND	.012 - .028	.0086
1,4-Diethylbenzene			
No. of Times Detected / No. of Samples	1 / 27	4 / 26	0 / 29
Range of Concentrations	.030	.032 - .039	ND
Diethylmethylbenzene			
No. of Times Detected / No. of Samples	1 / 27	2 / 26	0 / 29
Range of Concentrations	.041	.032 - .055	ND
(1,1-Dimethylethyl)benzene			
No. of Times Detected / No. of Samples	0 / 27	5 / 26	0 / 29
Range of Concentrations	ND	.0028 - .040	ND
1,3-Dimethyl-5-(1-methylethyl)benzene			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.022 - .049	ND
1,4-Dimethyl-2-(1-methylethyl)benzene			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	1 / 29
Range of Concentrations	.050	ND	.029
2,4-Dimethyl-1-(1-methylpropyl)benzene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.041	ND
(1,1-Dimethylpropyl)benzene			
No. of Times Detected / No. of Samples	0 / 27	5 / 26	1 / 29
Range of Concentrations	ND	.020 - .070	.090
(1,1-Dimethyl-2-propenyl)benzene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.091	ND
1-Ethyl-2,4-dimethylbenzene			
No. of Times Detected / No. of Samples	0 / 27	3 / 26	0 / 29
Range of Concentrations	ND	.013 - .10	ND
1-Ethyl-3,5-dimethylbenzene			
No. of Times Detected / No. of Samples	1 / 27	6 / 26	1 / 29
Range of Concentrations	.028	.030 - .096	.014
2-Ethyl-1,4-dimethylbenzene			
No. of Times Detected / No. of Samples	1 / 27	5 / 26	1 / 29
Range of Concentrations	.039	.019 - .120	.053
4-Ethyl-1,2-dimethylbenzene			
No. of Times Detected / No. of Samples	1 / 27	6 / 26	3 / 29
Range of Concentrations	.081	.0041 - .075	.016 - .026
1-Ethenyl-2-methylbenzene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.033	ND
1-Ethyl-2-methylbenzene			
No. of Times Detected / No. of Samples	8 / 27	17 / 26	11 / 29
Range of Concentrations	.0085 - .10	.009 - .18	.0034 - .077
1-Ethyl-4-methylbenzene			
No. of Times Detected / No. of Samples	5 / 27	15 / 26	10 / 29
Range of Concentrations	.0036 - .057	.006 - .070	.0037 - .048
1-Ethyl-4-(1-methylethyl)benzene			
No. of Times Detected / No. of Samples	0 / 27	3 / 26	0 / 29
Range of Concentrations	ND	.0084 - .059	ND
(1-Ethylpropyl)benzene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.043	ND
(1-Methylethyl)benzene			
No. of Times Detected / No. of Samples	2 / 27	3 / 26	1 / 29
Range of Concentrations	.0016 - .011	.0067 - .019	.0076
1-Methyl-2-(1-methylethyl)benzene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.029	.0058
1-Methyl-3-(1-methylethyl)benzene			
No. of Times Detected / No. of Samples	0 / 27	4 / 26	1 / 29
Range of Concentrations	ND	.025 - .040	.012

TABLE F - 19
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
1-Methyl-2-propylbenzene			
No. of Times Detected / No. of Samples	0 / 27	3 / 26	0 / 29
Range of Concentrations	ND	.0023 - .035	ND
1-Methyl-3-propylbenzene			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	1 / 29
Range of Concentrations	ND	.011 - .015	.015
1-Methyl-4-propylbenzene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.033	ND
Pentamethylbenzene			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.016 - .065	ND
1-Propenylbenzene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.0066	ND
1,2,3,4-Tetramethylbenzene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.0097	ND
1,2,3,5-Tetramethylbenzene			
No. of Times Detected / No. of Samples	1 / 27	10 / 26	1 / 29
Range of Concentrations	.042	.0047 - .094	.031
1,2,4,5-Tetramethylbenzene			
No. of Times Detected / No. of Samples	1 / 27	10 / 26	4 / 29
Range of Concentrations	.036	.0046 - .076	.016 - .034
1,2,3-Trimethylbenzene			
No. of Times Detected / No. of Samples	11 / 27	15 / 26	13 / 29
Range of Concentrations	.0078 - .087	.0075 - .22	.0062 - .12
1,2,4-Trimethylbenzene			
No. of Times Detected / No. of Samples	6 / 27	15 / 26	9 / 29
Range of Concentrations	.0029 - .072	.0055 - .16	.010 - .084
1,3,5-Trimethylbenzene			
No. of Times Detected / No. of Samples	3 / 27	14 / 26	8 / 29
Range of Concentrations	.022 - .088	.0030 - .14	.0045 - .092
Phthalates			
Dibutylphthalate			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.421
Diethylphthalate			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	1 / 29
Range of Concentrations	ND	.037 - .191	.428
Phenols			
2,6-Bis(1,1-dimethylethyl)-4-methylphenol			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.10	.066
Naphthalenes			
Decahydronaphthalene			
No. of Times Detected / No. of Samples	1 / 27	2 / 26	0 / 29
Range of Concentrations	.10	.063 - .070	ND
Decahydro-2-methylnaphthalene			
No. of Times Detected / No. of Samples	1 / 27	1 / 26	0 / 29
Range of Concentrations	.033	.0078	ND
1,3-Dimethylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.080	ND
1,4-Dimethylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.016	ND
1,8-Dimethylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.082	ND
2,3-Dimethylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.19	ND
1,5-Dimethyl-1,2,3,4-tetrahydronaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.043	ND
2,6-Dimethyl-1,2,3,4-tetrahydronaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.109	ND
2-Methyldecahydronaphthalene			
No. of Times Detected / No. of Samples	2 / 27	7 / 26	0 / 29
Range of Concentrations	.0098 - .028	.0054 - .098	ND
2-Methylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.12	ND

TABLE F - 19
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
2-Methyl-1,2,3,4-tetrahydronaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.031	.066
1,2,3,4-Tetrahydro-2,6-dimethylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.027	ND
1,2,3,4-Tetrahydro-2,7-dimethylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.097	ND
1,2,3,4-Tetrahydro-5,6-dimethylnaphthalene			
No. of Times Detected / No. of Samples	1 / 27	2 / 26	1 / 29
Range of Concentrations	.069	.013 - .035	.054
1,2,3,4-Tetrahydro-6,7-dimethylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.12	ND
1,2,3,4-Tetrahydro-1-methylnaphthalene			
No. of Times Detected / No. of Samples	1 / 27	2 / 26	1 / 29
Range of Concentrations	.082	.014 - .043	.053
1,2,3,4-Tetrahydro-2-methylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.028 - .087	ND
1,2,3,4-Tetrahydro-5-methylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.098	ND
1,2,3,4-Tetrahydro-6-methylnaphthalene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.098	ND
1,2,3,4-Tetrahydronaphthalene			
No. of Times Detected / No. of Samples	1 / 27	3 / 26	1 / 29
Range of Concentrations	.040	.012 - .072	.038
Other multiring aromatics			
2,3-Dihydro-1,1,3-trimethyl-3-phenylindene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	1.5	1.6
1,1-Dimethylindan			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.048 - .060	ND
1,2-Dimethylindan			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.072	ND
1,3-Dimethylindan			
No. of Times Detected / No. of Samples	0 / 27	4 / 26	0 / 29
Range of Concentrations	ND	.013 - .079	ND
1,6-Dimethylindan			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.017 - .061	ND
4,6-Dimethylindan			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.011	ND
4,7-Dimethylindan			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.015	ND
5,6-Dimethylindan			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.082	ND
Indan			
No. of Times Detected / No. of Samples	1 / 27	5 / 26	1 / 29
Range of Concentrations	.053	.0082 - .11	.031
Indene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.078	ND
1-Methylindan			
No. of Times Detected / No. of Samples	1 / 27	2 / 26	0 / 29
Range of Concentrations	.048	.0057 - .050	ND
4-Methylindan			
No. of Times Detected / No. of Samples	1 / 27	4 / 26	0 / 29
Range of Concentrations	.022	.020 - .031	ND
5-Methylindan			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.013 - .038	ND
1,1,5-Trimethylindan			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.056	ND
4,5,7-Trimethylindan			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.081	ND

TABLE F - 19
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
SYNTHETIC ORGANIC CHEMICALS — HALOGENATED AROMATICS			
Halogenated Benzenes			
1-Chloro-3-methylbenzene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.0014	ND
MISCELLANEOUS ORGANIC CHEMICALS			
Amines			
o-Decylhydroxylamine			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.023	ND	ND
Halogenated Ethers			
1,3,5-Trichloro-2-methoxybenzene			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.0062	ND	ND
Heterocyclic Compounds			
4,5-Diethyl-2,3-dihydro-2,3-dimethylfuran			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.16	ND	ND
2,2,4,4-Tetramethyltetrahydrofuran			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.011	ND
Ketones			
2,5-Dimethyl-3,4-hexanedione			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.022	ND	ND
2,2-Dimethyl-3-hexanone			
No. of Times Detected / No. of Samples	5 / 27	0 / 26	2 / 29
Range of Concentrations	.006 - .063	ND	.006 - .016
2,4-Dimethyl-3-hexanone			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	1 / 29
Range of Concentrations	0.015	ND	0.041
4-Hydroxy-4-methyl-2-pentanone			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.11	.022
Isophorone			
No. of Times Detected / No. of Samples	1 / 27	1 / 26	1 / 29
Range of Concentrations	0.042	.200	.160
6-Methyl-1-nonen-4-one			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.034	ND
6-Methyl-5-nonen-4-one			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.005	ND
4-Methyl-2-pentanone			
No. of Times Detected / No. of Samples	2 / 27	3 / 26	2 / 29
Range of Concentrations	.0073 - .22	.025 - .058	.051 - .060
Natural Odor Producing Compounds			
1-Methyl-4-(1-methylethyl)-7-oxabicyclo-(2.2.1)heptane			
No. of Times Detected / No. of Samples	2 / 27	11 / 26	3 / 29
Range of Concentrations	.029 - .085	.0035 - .046	.017 - .062
1,3,3-Trimethylbicyclo-(2.2.1)heptan-2-one			
No. of Times Detected / No. of Samples	1 / 27	2 / 26	2 / 29
Range of Concentrations	.088	.014 - .031	.011 - .070
1,3,3-Trimethyl-2-oxabicyclo(2.2.2)octane			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.022 - .033	ND
Organic Acids			
Hexadecanoic Acid			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.42	.14
Alcohols			
2,2-Dimethyl-1-butanol			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.016	ND
2,4-Dimethyl-4-heptanol			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.016	ND
3,4-Dimethyl-4-heptanol			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.012	ND
2,3-Dimethyl-2-hexanol			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.020

TABLE F - 19
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
3,6-Dimethyl-3-octanol			
No. of Times Detected / No. of Samples	1 / 27	1 / 26	1 / 29
Range of Concentrations	.076	.019	.053
2-Ethylhexanol			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.040
1-Heptadecanol			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.069	ND	ND
3-Heptanol			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.010
3-Methyl-1-heptanol			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.021
3-Methyl-4-heptanol			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.014
4-Methyl-3-heptanol			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.010
4-Methyl-4-heptanol			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.005
6-Methyl-3-heptanol			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.014
4-Methyl-1-hexanol			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.012	ND	ND
3-Methyl-1-hexanol			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.012
3-Methyl-3-octanol			
No. of Times Detected / No. of Samples	1 / 27	1 / 26	0 / 29
Range of Concentrations	.028	.014	ND
6-Methyl-1-octanol			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.0062	.0067
2-Methyl-2-propanol			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.016	ND	ND
4-Methyl-2-propylpentanol			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.034
1,9-Nonanediol			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.0069	ND
2-Propyl-1-heptanol			
No. of Times Detected / No. of Samples	1 / 27	1 / 26	0 / 29
Range of Concentrations	.043	.0079	ND
2,2,4-Trimethyl-3-penten-1-ol			
No. of Times Detected / No. of Samples	2 / 27	0 / 26	0 / 29
Range of Concentrations	.080	ND	ND
Aldehydes			
Decanal			
No. of Times Detected / No. of Samples	5 / 27	6 / 26	6 / 29
Range of Concentrations	.034 - .058	.0064 - .043	.0079 - .080
3,3-Dimethylhexanal			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.012	.0028
Nonanal			
No. of Times Detected / No. of Samples	5 / 27	4 / 26	5 / 29
Range of Concentrations	.017 - .062	.022 - .042	.012 - .18
Heptanal			
No. of Times Detected / No. of Samples	2 / 27	2 / 26	2 / 29
Range of Concentrations	ND - .012	.011 - .022	.013 - .044
Hexanal			
No. of Times Detected / No. of Samples	3 / 27	3 / 26	5 / 29
Range of Concentrations	.011 - .063	.013 - .040	.0065 - .10
4-Methylhexanal			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.004
Undecanal			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.011	ND
Alkanes			
C13-alkanes			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.017	.020

TABLE F - 19
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
2,5-Dimethylheptane			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.010
2,4-Dimethylhexane			
No. of Times Detected / No. of Samples	1 / 27	1 / 26	0 / 29
Range of Concentrations	.25	.018	ND
3,3-Dimethylhexane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	0.022	ND
2,5-Dimethylnonane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.017	ND
2,6-Dimethyloctane			
No. of Times Detected / No. of Samples	1 / 27	2 / 26	1 / 29
Range of Concentrations	.14	.014 - .046	[illegible]
2,6-Dimethylundecane			
No. of Times Detected / No. of Samples	0 / 27	3 / 26	[illegible] 29
Range of Concentrations	ND	.047 - .11	[illegible]
4,8-Dimethylundecane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	[illegible] 29
Range of Concentrations	ND	.024	[illegible]
Dodecane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	[illegible]
Range of Concentrations	ND	.011	[illegible]
Eicosane			
No. of Times Detected / No. of Samples	2 / 27	6 / 26	6 / 29
Range of Concentrations	.026 - .059	.015 - .13	.0077 - .090
3-Ethyl-2-methylheptane			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.015 - .025	ND
5-Ethyl-2-methylheptane			
No. of Times Detected / No. of Samples	2 / 27	3 / 26	3 / 29
Range of Concentrations	.024 - .047	.0094 - .034	.009 - .051
3-Ethyl-2-methylpentane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.0069	ND
Heneicosane			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	1 / 29
Range of Concentrations	ND	.012 - .023	.026
2,2,3,3,5,6,6-Heptamethylheptane			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.099
Hexadecane			
No. of Times Detected / No. of Samples	1 / 27	6 / 26	2 / 29
Range of Concentrations	.039	.021 - .267	.0045 - .027
Hexane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.021	ND
5-Methyl-2-ethylheptane			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.061	ND	ND
3-Methylheptane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.013	ND
3-Methylnonane			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.016 - .042	ND
3-Methyloctane			
No. of Times Detected / No. of Samples	1 / 27	1 / 26	0 / 29
Range of Concentrations	.0039	.033	ND
7-Methyltridecane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.12	.044
Octadecane			
No. of Times Detected / No. of Samples	1 / 27	7 / 26	8 / 29
Range of Concentrations	.124	.035 - .27	.0061 - .145
2,2,4,6,6-Pentamethylheptane			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	2 / 29
Range of Concentrations	ND	.013 - .050	.012 - .021
Tetradecane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.15	ND
2,6,10,14-Tetramethylheptadecane			
No. of Times Detected / No. of Samples	3 / 27	8 / 26	7 / 29
Range of Concentrations	.039 - .058	.016 - .10	.015 - .10
2,2,4,6-Tetramethylheptane			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.067	ND	ND
2,2,3,3-Tetramethylpentane			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	1 / 29
Range of Concentrations	.052	ND	.063
2,2,3,4-Tetramethylpentane			
No. of Times Detected / No. of Samples	4 / 27	1 / 26	1 / 29
Range of Concentrations	.020 - .11	.011	.054

TABLE F - 19
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Tridecane			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.069	ND	ND
2,6,11-Trimethyldodecane			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	1 / 29
Range of Concentrations	.045	ND	.095
2,2,4-Trimethylheptane			
No. of Times Detected / No. of Samples	2 / 27	0 / 26	1 / 29
Range of Concentrations	.013 - .24	ND	.030
2,2,3-Trimethylhexane			
No. of Times Detected / No. of Samples	3 / 27	3 / 26	3 / 29
Range of Concentrations	.0072 - .125	.0089 - .085	.013 - .17
2,2,4-Trimethylhexane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	2 / 29
Range of Concentrations	ND	.008	.014 - .022
2,2,5-Trimethylhexane			
No. of Times Detected / No. of Samples	1 / 27	2 / 26	1 / 29
Range of Concentrations	.013	.0022 - .012	.015
2,3,3-Trimethylpentane			
No. of Times Detected / No. of Samples	2 / 27	1 / 26	1 / 29
Range of Concentrations	.052 - .059	.0068	.033
Undecane			
No. of Times Detected / No. of Samples	1 / 27	2 / 26	0 / 29
Range of Concentrations	.173	.0077 - .032	ND
Alkenes			
3,7-Dimethyl-1,3,7-octatriene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.013	ND
2-Methyl-1-pentadecene			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.135	ND	ND
7-Methyl-6-tridecene			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	1 / 29
Range of Concentrations	.044	ND	.011
1-Pentadecene			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.054	ND	ND
2,2,5,5-Tetramethyl-3-hexene			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.010 - .025	ND
3,4,5-Trimethylhexene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.044	ND
3,4,5-Trimethyl-1-hexene			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.035	.043
4,6,8-Trimethyl-1-nonene			
No. of Times Detected / No. of Samples	1 / 27	2 / 26	2 / 29
Range of Concentrations	.030	.010 - .053	.0040 - .030
2,2,7-Trimethyl-3-octyne			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.011	ND	ND
2,2,4-Trimethyl-1-pentene			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	2 / 29
Range of Concentrations	.10	ND	.046 - .22
2,4,4-Trimethyl-1-pentene			
No. of Times Detected / No. of Samples	2 / 27	0 / 26	0 / 29
Range of Concentrations	.047 - .144	ND	ND
Cyclic Alkanes			
2-Butyl-1,1,3-trimethylcyclohexane			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.052	ND	ND
Cyclopropylcyclohexane			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.0090 - .018	ND
1-Ethenyl-2-hexenylcyclopropane			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.025
1-Ethyl-1-methylcyclohexane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.019	ND
1-Ethyl-2-methylcyclohexane			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.012	ND	ND
1-Ethyl-4-methylcyclohexane			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	0 / 29
Range of Concentrations	ND	.0057 - .013	ND
1-Ethyl-3-methylcyclopentane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.060	ND

TABLE F - 19
CHARACTERIZATION OF INFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blue Plains Nitrified Effluent	Potomac River Estuary	EEWTP Blend Tank
Methylcyclohexane			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.033	ND	ND
1-Methylethylcyclohexane			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.022	ND	ND
5-Methyl-2-(1-methylethyl)cyclohexanol			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.0097	ND
1-Methyl-3-(1-methylethenyl)cyclohexane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.0086	ND
1-Methyl-4-(1-methylethenyl)cyclohexane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.016	ND
1-Methyl-4-(1-methylethyl)cyclohexane			
No. of Times Detected / No. of Samples	2 / 27	8 / 26	5 / 29
Range of Concentrations	.0074 - .024	.041 - .075	.013 - .038
Propylcyclohexane			
No. of Times Detected / No. of Samples	0 / 27	4 / 26	0 / 29
Range of Concentrations	ND	.0031 - .023	ND
1,1,2-Trimethylcyclohexane			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	0 / 29
Range of Concentrations	.064	ND	ND
1,1,3-Trimethylcyclohexane			
No. of Times Detected / No. of Samples	1 / 27	1 / 26	1 / 29
Range of Concentrations	.022	.013	.038
1,2,3-Trimethylcyclohexane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.020	ND
1,3,5-Trimethylcyclohexane			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.0060
Cyclic Alkenes			
3,5-Bis(1,1-dimethylethyl)-4-hydroxy-2,4-cyclohexadien-1-one			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	1 / 29
Range of Concentrations	ND	.18	.22
Esters			
Butyl acetate			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.023	ND
Butyl-2-methylpropanoate			
No. of Times Detected / No. of Samples	0 / 27	2 / 26	2 / 29
Range of Concentrations	ND	.017 - .048	.0070 - .040
Butyl-2-propanoate			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	1 / 29
Range of Concentrations	.011	ND	.016
2,2-Dimethyl-3-hexanoate			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.0050
Ethenylbutanoate			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.0050
2-Methyl propanoic acid, butyl ester			
No. of Times Detected / No. of Samples	2 / 27	2 / 26	4 / 29
Range of Concentrations	.311 - 1.5	.039 - .76	.046 - .261
1-Methylpropylbutanoate			
No. ofQTimes Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.033	ND
Ethers			
(Ethenyloxy)isoctane			
No. of Times Detected / No. of Samples	0 / 27	1 / 26	0 / 29
Range of Concentrations	ND	.016	ND
Sulfur containing organic compounds			
Dimethyldisulfide			
No. of Times Detected / No. of Samples	1 / 27	0 / 26	1 / 29
Range of Concentrations	.078	ND	.011
Dimethyltrisulfide			
No. of Times Detected / No. of Samples	0 / 27	0 / 26	1 / 29
Range of Concentrations	ND	ND	.0058

TABLE F-20
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TE

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % Confidence Interval[1]	Mutagenic Ratio
Blue Plains Nitrified Effluent (Phase IA) (Note: Monitoring initiated in December 1981)					
5-Dec-1981					
	TA98	91.00	1.48	2.81	1.7
	TA98+S9	91.00	4.41	2.52	1.9
	TA100	91.00	8.27	7.53	1.2
	TA100+S9	91.00	4.58	9.94	1.4
10-Feb-1982					
	TA98	102.20	1.93	.91	1.8
	TA98+S9	102.20	2.21	2.15	1.9
	TA100	102.20	3.14	6.20	1.3
	TA100+S9	102.20	4.05	4.74	1.3
23-Feb-1982					
	TA98	83.30	N.A.	N.A.	N.A.
	TA98+S9	83.30	N.A.	N.A.	N.A.
	TA100	83.30	N.A.	N.A.	N.A.
	TA100+S9	83.30	N.A.	N.A.	N.A.
2-Mar-1982					
	TA98	53.00	2.27	2.66	1.5
	TA98+S9	53.00	12.52	4.83	2.9
	TA100	53.00	4.59	9.67	1.1
	TA100+S9	53.00	6.71	6.16	1.2
16-Mar-1982					
	TA98	26.50	.30	2.66	1.1
	TA98+S9	26.50	5.44	5.40	1.9
	TA100	26.50	15.18	10.53	1.4
	TA100+S9	26.50	9.14	4.34	1.2
Blue Plains Nitrified Effluent (Phase IB)					
30-Mar-1982					
	TA98	75.70	1.72	1.76	1.4
	TA98+S9	75.70	4.60	2.77	2.3
	TA100	75.70	5.39	3.30	1.2
	TA100+S9	75.70	4.66	5.38	1.2
31-Mar-1982					
	TA98	68.10	.51	2.48	2.1
	TA98+S9	68.10	9.34	4.09	3.8
	TA100	68.10	8.37	4.68	1.4
	TA100+S9	68.10	6.58	6.10	1.3
6-Apr-1982					
	TA98	90.80	1.02	1.28	1.5
	TA98+S9	90.80	2.52	1.66	1.7
	TA100	90.80	2.16	5.57	1.3
	TA100+S9	90.80	2.75	3.30	1.2
4-May-1982					
	TA98	45.40	7.94	4.12	2.6
	TA98+S9	45.40	39.39	10.88	7.2
	TA100	45.40	6.03	10.17	1.2
	TA100+S9	45.40	16.66	11.59	1.5
12-May-1982					
	TA98	113.60	3.04	1.50	2.8
	TA98+S9	113.60	4.21	2.80	3.3
	TA100	113.60	3.45	3.65	1.3
	TA100+S9	113.60	3.19	4.06	1.3
26-May-1982					
	TA98	102.20	2.62	1.28	2.2
	TA98+S9	102.20	5.16	1.64	2.7
	TA100	102.20	.24	3.21	1.1
	TA100+S9	102.20	3.29	3.78	1.3
16-Jun-1982					
	TA98	75.70	2.85	2.33	1.9
	TA98+S9	75.70	5.10	2.22	2.3
	TA100	75.70	.59	5.17	1.2
	TA100+S9	75.70	3.63	2.51	1.1
22-Jun-1982					
	TA98	106.00	3.20	1.33	2.1
	TA98+S9	106.00	4.84	1.77	2.2
	TA100	106.00	7.05	5.00	1.5
	TA100+S9	106.00	4.82	3.93	1.3
23-Jun-1982					
	TA98	102.20	1.74	1.79	2.1
	TA98+S9	102.20	2.57	1.67	1.9
	TA100	102.20	-3.00	3.85	1.0
	TA100+S9	102.20	3.27	3.74	1.2

TABLE F-20
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		Blue Plains Nitrified Effluent (Phase IIA)			
18-Aug-1982					
	TA98	60.60	5.25	1.66	2.3
	TA98+S9	60.60	4.01	6.43	2.8
	TA100	60.60	7.75	8.14	1.3
	TA100+S9	60.60	-.71	6.44	1.1
22-Sep-1982					
	TA98	170.30	1.50	.82	1.7
	TA98+S9	170.30	.79	1.55	1.6
	TA100	170.30	3.08	1.58	1.3
	TA100+S9	170.30	3.25	3.11	1.4
6-Oct-1982					
	TA98	121.10	6.33	2.71	2.9
	TA98+S9	121.10	3.41	4.78	3.9
	TA100	121.10	4.57	3.80	1.4
	TA100+S9	121.10	.41	3.74	1.2
25-Oct-1982					
	TA98	79.50	1.15	2.72	1.8
	TA98+S9	79.50	1.94	1.0	1.3
	TA100	79.50	.53	4.26	1.1
	TA100+S9	79.50	6.93	5.29	1.3
2-Nov-1982					
	TA98	68.10	-.07	1.59	1.5
	TA98+S9	68.10	.76	2.18	1.3
	TA100	68.10	-.72	4.00	1.
	TA100+S9	68.10	2.06	4.78	1.0
17-Nov-1982					
	TA98	64.30	-.10	2.14	1.0
	TA98+S9	64.30	N.A.	N.A.	N.A.
	TA100	64.30	-5.28	13.79	.9
	TA100+S9	64.30	N.A.	N.A.	N.A.
30-Nov-1982					
	TA98	45.40	-1.43	2.34	.8
	TA98+S9	45.40	.47	2.25	1.1
	TA100	45.40	10.02	9.19	1.3
	TA100+S9	45.40	-1.28	12.38	1.2
14-Dec-1982					
	TA98	68.10	10.17	2.52	3.0
	TA98+S9	68.10	9.97	9.53	4.1
	TA100	68.10	-7.85	6.19	1.2
	TA100+S9	68.10	2.89	3.78	1.1
29-Dec-1982					
	TA98	71.90	1.02	1.20	1.3
	TA98+S9	71.90	1.86	2.01	1.5
	TA100	71.90	1.84	5.96	1.1
	TA100+S9	71.90	2.54	7.27	1.3
25-Jan-1983					
	TA98	15.10	10.65	6.89	1.4
	TA98+S9	15.10	N.A.	N.A.	N.A.
	TA100	15.10	17.16	29.65	1.3
	TA100+S9	15.10	N.A.	N.A.	N.A.

TABLE F-20
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % Confidence Interval[1]	Mutagenic Ratio
			Potomac River Estuary (Phase IA) (Note: Monitoring initiated in December 1981)		
5-Dec-1981					
	TA98	90.00	2.49	1.03	2.0
	TA98+S9	90.00	3.82	1.56	2.0
	TA100	90.00	5.90	4.07	1.2
	TA100+S9	90.00	8.08	3.62	1.3
10-Feb-1982					
	TA98	49.20	4.90	3.14	1.9
	TA98+S9	49.20	8.83	3.21	2.1
	TA100	49.20	5.68	5.83	1.1
	TA100+S9	49.20	14.55	6.13	1.3
23-Feb-1982					
	TA98	75.70	N.A.	N.A.	N.A.
	TA98+S9	75.70	N.A.	N.A.	N.A.
	TA100	75.70	N.A.	N.A.	N.A.
	TA100+S9	75.70	N.A.	N.A.	N.A.
9-Mar-1982					
	TA98	94.60	3.41	1.52	2.2
	TA98+S9	94.60	N.A.	N.A.	N.A.
	TA100	94.60	5.41	4.28	1.3
	TA100+S9	94.60	N.A.	N.A.	N.A.
16-Mar-1982					
	TA98	26.50	-.95	3.67	.8
	TA98+S9	26.50	.26	3.17	1.0
	TA100	26.50	11.00	5.84	1.2
	TA100+S9	26.50	5.76	11.28	1.1
			Potomac River Estuary (Phase IB)		
30-Mar-1982					
	TA98	90.80	1.53	.84	1.7
	TA98+S9	90.80	2.03	1.70	2.0
	TA100	90.80	-.32	3.38	1.2
	TA100+S9	90.80	4.14	3.03	1.2
31-Mar-1982					
	TA98	98.40	.35	1.17	1.5
	TA98+S9	98.40	2.48	1.75	2.2
	TA100	98.40	.25	3.36	1.1
	TA100+S9	98.40	1.60	4.84	1.3
6-Apr-1982					
	TA98	60.60	1.44	2.13	1.5
	TA98+S9	60.60	2.46	1.79	1.6
	TA100	60.60	1.24	8.47	1.1
	TA100+S9	60.60	7.13	5.61	1.3
20-Apr-1982					
	TA98	56.80	2.23	2.58	1.7
	TA98+S9	56.80	5.89	2.59	2.1
	TA100	56.80	1.14	10.45	1.3
	TA100+S9	56.80	4.77	7.59	1.2
27-Apr-1982					
	TA98	71.90	3.83	2.61	2.1
	TA98+S9	71.90	5.27	2.10	1.9
	TA100	71.90	2.98	5.59	1.1
	TA100+S9	71.90	2.21	5.64	1.1
11-May-1982					
	TA98	53.00	1.53	2.41	1.3
	TA98+S9	53.00	.51	3.22	1.2
	TA100	53.00	N.A.	N.A.	N.A.
	TA100+S9	53.00	N.A.	N.A.	N.A.
25-May-1982					
	TA98	113.60	.37	.98	1.2
	TA98+S9	113.60	1.17	1.30	1.4
	TA100	113.60	3.39	2.45	1.2
	TA100+S9	113.60	1.08	2.72	1.1
2-Jun-1982					
	TA98	94.60	2.53	1.36	1.8
	TA98+S9	94.60	6.18	1.18	3.4
	TA100	94.60	-1.46	5.29	.9
	TA100+S9	94.60	-1.23	4.54	.9
16-Jun-1982					
	TA98	49.20	8.12	3.75	2.6
	TA98+S9	49.20	11.61	3.60	2.9
	TA100	49.20	-11.64	14.56	.9
	TA100+S9	49.20	7.51	9.26	1.3
23-Jun-1982					
	TA98	98.40	1.06	1.48	1.4
	TA98+S9	98.40	2.72	1.46	1.9
	TA100	98.40	-1.60	2.99	.9
	TA100+S9	98.40	1.24	3.26	1.1

TABLE F-20
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		Potomac River Estuary (Phase IA, continued)			
29-Jun-1982					
	TA98	87.10	1.54	1.34	1.5
	TA98+S9	87.10	2.63	1.70	1.6
	TA100	87.10	-1.35	4.26	1.1
	TA100+S9	87.10	-.62	2.82	1.0
		Potomac River Estuary (Phase IIA)			
21-Jul-1982					
	TA98	83.30	.38	1.19	1.2
	TA98+S9	83.30	N.A.	N.A.	N.A.
	TA100	83.30	1.51	3.60	1.0
	TA100+S9	83.30	N.A.	N.A.	N.A.
3-Aug-1982					
	TA98	106.00	3.78	2.66	2.1
	TA98+S9	106.00	6.82	2.71	3.4
	TA100	106.00	3.76	3.43	1.2
	TA100+S9	106.00	8.27	2.59	1.5
31-Aug-1982					
	TA98	37.90	6.29	4.25	2.2
	TA98+S9	37.90	10.18	5.21	2.3
	TA100	37.90	-3.13	4.29	1.
	TA100+S9	37.90	.64	14.06	1.0
21-Sep-1982					
	TA98	94.60	2.88	1.78	1.6
	TA98+S9	94.60	1.88	1.41	1.5
	TA100	94.60	2.93	2.53	1.2
	TA100+S9	94.60	5.04	2.56	1.3
6-Oct-1982					
	TA98	90.80	2.02	1.29	1.5
	TA98+S9	90.80	5.84	3.43	2.3
	TA100	90.80	3.77	2.64	1.2
	TA100+S9	90.80	4.31	4.45	1.3
25-Oct-1982					
	TA98	79.50	2.24	2.00	1.8
	TA98+S9	79.50	1.41	1.49	1.2
	TA100	79.50	5.15	5.26	1.2
	TA100+S9	79.50	4.37	5.90	1.2
2-Nov-1982					
	TA98	68.10	1.40	2.70	2.0
	TA98+S9	68.10	6.24	2.01	1.8
	TA100	68.10	6.44	5.82	1.2
	TA100+S9	68.10	.32	10.27	1.2
16-Nov-1982					
	TA98	56.80	-.10	3.10	1.0
	TA98+S9	56.80	N.A.	N.A.	N.A.
	TA100	56.80	11.38	6.08	1.4
	TA100+S9	56.80	N.A.	N.A.	N.A.
30-Nov-1982					
	TA98	41.60	3.01	2.87	1.6
	TA98+S9	41.60	6.16	1.05	2.3
	TA100	41.60	1.77	6.84	1.1
	TA100+S9	41.60	8.89	5.63	1.2
14-Dec-1982					
	TA98	37.90	1.17	3.32	1.0
	TA98+S9	37.90	-.42	3.80	.9
	TA100	37.90	15.22	8.51	1.4
	TA100+S9	37.90	9.52	15.22	1.3
29-Dec-1982					
	TA98	79.50	-.89	1.24	.8
	TA98+S9	79.50	-.40	1.34	.8
	TA100	79.50	-3.89	7.04	.9
	TA100+S9	79.50	1.37	5.80	1.0
25-Jan-1983					
	TA98	30.30	.61	4.76	1.3
	TA98+S9	30.30	N.A.	N.A.	N.A.
	TA100	30.30	16.74	19.33	1.4
	TA100+S9	30.30	N.A.	N.A.	N.A.
7-Feb-1983					
	TA98	53.00	N.A.	N.A.	N.A.
	TA98+S9	53.00	N.A.	N.A.	N.A.
	TA100	53.00	N.A.	N.A.	N.A.
	TA100+S9	53.00	N.A.	N.A.	N.A.
18-Feb-1983					
	TA98	30.30	6.44	3.14	2.0
	TA98+S9	30.30	7.26	2.84	2.1
	TA100	30.30	N.A.	N.A.	N.A.
	TA100+S9	30.30	N.A.	N.A.	N.A.

TABLE F-20
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		EEWTP Blended Influent (Phase IA) (Note: Monitoring initiated in December 1981)			
8-Dec-1981					
	TA98	36.00	3.59	3.92	1.7
	TA98+S9	36.00	1.85	3.18	1.1
	TA100	36.00	2.20	10.72	1.1
	TA100+S9	36.00	4.51	7.11	1.1
27-Jan-1982					
	TA98	19.70	1.01	6.53	1.1
	TA98+S9	19.70	7.04	7.40	2.0
	TA100	19.70	-.00	15.47	1.0
	TA100+S9	19.70	18.39	8.33	1.2
9-Feb-1982					
	TA98	83.30	.70	2.48	1.3
	TA98+S9	83.30	7.78	4.06	2.6
	TA100	83.30	2.12	6.10	1.0
	TA100+S9	83.30	.62	3.02	1.1
23-Feb-1982					
	TA98	68.10	1.25	2.73	1.9
	TA98+S9	68.10	3.22	4.40	2.1
	TA100	68.10	5.51	3.82	1.2
	TA100+S9	68.10	.31	3.37	1.1
2-Mar-1982					
	TA98	109.80	1.79	2.07	1.8
	TA98+S9	109.80	3.41	1.00	2.1
	TA100	109.80	3.17	4.51	1.2
	TA100+S9	109.80	3.35	3.82	1.2
9-Mar-1982					
	TA98	45.40	4.82	2.72	1.9
	TA98+S9	45.40	N.A.	N.A.	N.A.
	TA100	45.40	2.43	6.60	1.1
	TA100+S9	45.40	N.A.	N.A.	N.A.
16-Mar-1982					
	TA98	22.70	3.30	4.73	1.5
	TA98+S9	22.70	.30	2.49	1.0
	TA100	22.70	5.87	7.64	1.1
	TA100+S9	22.70	1.54	9.44	1.0
16-Mar-1982					
	TA98	22.70	3.30	4.73	1.5
	TA98+S9	22.70	.30	2.49	1.0
	TA100	22.70	5.87	7.64	1.1
	TA100+S9	22.70	1.54	9.44	1.0
		EEWTP Blended Influent (Phase IB)			
6-Apr-1982					
	TA98	49.20	1.56	3.06	1.4
	TA98+S9	49.20	4.25	3.79	1.6
	TA100	49.20	2.97	8.69	1.0
	TA100+S9	49.20	3.19	6.59	1.1
7-Apr-1982					
	TA98	45.40	22.94	9.00	5.7
	TA98+S9	45.40	19.72	5.36	4.8
	TA100	45.40	1.60	11.66	1.0
	TA100+S9	45.40	11.32	10.61	1.3
20-Apr-1982					
	TA98	18.90	8.69	4.86	1.6
	TA98+S9	18.90	13.14	7.66	1.8
	TA100	18.90	-.42	16.38	1.
	TA100+S9	18.90	3.60	26.03	1.0
27-Apr-1982					
	TA98	83.30	3.83	1.27	2.1
	TA98+S9	83.30	5.53	2.25	2.0
	TA100	83.30	3.46	5.06	1.2
	TA100+S9	83.30	4.98	5.82	1.1
28-Apr-1982					
	TA98	22.70	8.40	5.22	2.3
	TA98	98.40	2.15	1.44	1.9
	TA98+S9	22.70	18.42	5.83	3.3
	TA98+S9	98.40	7.58	4.40	3.9
	TA100	22.70	13.55	14.31	1.3
	TA100	98.40	7.25	3.53	1.4
	TA100+S9	22.70	12.12	4.42	1.3
	TA100+S9	98.40	7.55	5.36	1.4

TABLE F-20
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % Confidence Interval [1]	Mutagenic Ratio
		EEWTP Blended Influent (Phase IB, continued)			
11-May-1982					
	TA98	90.80	3.20	1.60	1.8
	TA98+S9	90.80	6.48	2.46	2.0
	TA100	90.80	N.A.	N.A.	N.A.
	TA100+S9	90.80	N.A.	N.A.	N.A.
12-May-1982					
	TA98	68.10	2.68	1.32	1.9
	TA98+S9	68.10	7.47	1.94	3.3
	TA100	68.10	3.99	5.61	1.2
	TA100+S9	68.10	.74	7.98	1.3
25-May-1982					
	TA98	132.50	1.66	1.40	1.6
	TA98+S9	132.50	1.85	1.46	1.6
	TA100	132.50	.05	2.23	1.1
	TA100+S9	132.50	-.85	6.24	1.
26-May-1982					
	TA98	90.80	1.62	1.37	1.7
	TA98+S9	90.80	2.31	1.56	1.7
	TA100	90.80	-.64	5.90	1.1
	TA100+S9	90.80	3.77	1.96	1.2
16-Jun-1982					
	TA98	41.60	3.71	2.80	2.1
	TA98+S9	41.60	4.03	3.26	1.9
	TA100	41.60	7.25	4.19	1.3
	TA100+S9	41.60	11.53	10.34	1.5
22-Jun-1982					
	TA98	75.70	3.68	2.14	2.3
	TA98+S9	75.70	11.44	1.98	4.8
	TA100	75.70	-.17	5.68	1.1
	TA100+S9	75.70	.48	6.40	1.1
29-Jun-1982					
	TA98	79.50	4.01	1.53	2.1
	TA98+S9	79.50	16.19	1.81	4.7
	TA100	79.50	.64	4.60	1.1
	TA100+S9	79.50	6.97	7.57	1.3
		EEWTP Blended Influent (Phase IIA)			
21-Jul-1982					
	TA98	53.00	-.04	3.30	1.4
	TA98+S9	53.00	N.A.	N.A.	N.A.
	TA100	53.00	6.50	10.37	1.1
	TA100+S9	53.00	N.A.	N.A.	N.A.
3-Aug-1982					
	TA98	98.40	4.16	1.99	1.9
	TA98+S9	98.40	5.95	2.35	3.2
	TA100	98.40	.97	3.19	1.1
	TA100+S9	98.40	3.64	4.22	1.3
31-Aug-1982					
	TA98	83.30	3.29	1.51	2.3
	TA98+S9	83.30	4.33	3.18	2.4
	TA100	83.30	.71	4.05	1.0
	TA100+S9	83.30	2.55	4.16	1.2
21-Sep-1982					
	TA98	151.40	9.05	5.46	2.7
	TA98+S9	151.40	9.95	5.65	2.6
	TA100	151.40	9.54	3.34	1.4
	TA100+S9	151.40	9.11	6.66	1.3
22-Sep-1982					
	TA98	117.30	2.39	1.32	1.8
	TA98+S9	117.30	3.01	2.80	1.8
	TA100	117.30	4.55	1.66	1.3
	TA100+S9	117.30	4.90	3.27	1.4
6-Oct-1982					
	TA98	102.20	2.76	1.29	2.8
	TA98+S9	102.20	3.87	3.97	3.2
	TA100	102.20	4.30	4.01	1.3
	TA100+S9	102.20	3.78	5.55	1.2
25-Oct-1982					
	TA98	109.80	2.09	1.58	2.0
	TA98+S9	109.80	2.55	1.45	1.6
	TA100	109.80	1.89	2.72	1.1
	TA100+S9	109.80	-1.47	4.81	1.2
2-Nov-1982					
	TA98	56.80	-.16	1.16	1.2
	TA98+S9	56.80	2.04	2.36	1.5
	TA100	56.80	-3.81	6.88	1.1
	TA100+S9	56.80	1.96	4.53	1.0

TABLE F-20
CHARACTERIZATION OF INFLUENTS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		EEWTP Blended Influent (Phase IIA, continued)			
16-Nov-1982					
	TA98	107.90	1.89	1.28	1.8
	TA98+S9	107.90	N.A.	N.A.	N.A.
	TA100	107.90	2.26	2.63	1.1
	TA100+S9	107.90	N.A.	N.A.	N.A.
30-Nov-1982					
	TA98	34.10	2.58	3.20	1.4
	TA98+S9	34.10	15.96	1.74	3.7
	TA100	34.10	-5.40	6.31	.9
	TA100+S9	34.10	16.78	6.61	1.4
14-Dec-1982					
	TA98	45.00	.80	1.55	1.3
	TA98+S9	45.00	1.82	2.69	1.8
	TA100	45.00	1.42	8.79	1.9
	TA100+S9	45.00	4.65	7.42	1.6
21-Dec-1982					
	TA98	75.70	1.23	1.20	1.6
	TA98+S9	75.70	3.03	2.12	2.4
	TA100	75.70	6.56	3.26	2.0
	TA100+S9	75.70	3.72	6.41	1.6
25-Jan-1983					
	TA98	64.30	1.57	1.93	1.3
	TA98+S9	64.30	N.A.	N.A.	N.A.
	TA100	64.30	11.55	9.50	1.5
	TA100+S9	64.30	N.A.	N.A.	N.A.
8-Feb-1983					
	TA98	90.80	2.15	.83	2.0
	TA98+S9	90.80	3.59	1.12	2.6
	TA100	90.80	2.37	4.62	1.3
	TA100+S9	90.80	2.39	3.82	1.3
15-Feb-1983					
	TA98	75.70	1.24	1.11	1.5
	TA98+S9	75.70	2.03	1.06	1.8
	TA100	75.70	5.29	6.35	1.4
	TA100+S9	75.70	1.76	4.91	1.3

1. Numbers refer to the size of the interval bracketing the corresponding specific activity value; i.e. Specific Activity ± Confidence Interval.

APPENDIX G

PROCESS PERFORMANCE

This appendix provides statistical summary tables of the EEWTP monitoring data collected during each of four phases of operation. Each table contains summaries of data from all monitored sets including:

Blended influent
Sedimentation effluent (or recarbonation effluent)
Dual media filter effluent
Lead carbon column effluent
Final carbon column effluent
EEWTP finished water

Appendix G has been broken into four sections, each of which provides summary tables for one of the phases of EEWTP operation. The sections are as follows:

Appendix G-1:
Process Performance - 16 March 1981 to 16 March 1982 (Phase IA)
Appendix G-2:
Process Performance - 17 March 1982 to 6 July 1982 (Phase IB)
Appendix G-3:
Process Performance - 16 July 1982 to 1 February 1983 (Phase IIA)
Appendix G-4:
Process Performance - 2 February 1983 to 16 March 1983 (Phase IIB)

The statistical results reported in the tables of this appendix have been calculated using the techniques described in the Main Volume of the report, Chapter 5. These have been summarized in Table 5.1-2 of that chapter. As discussed in Chapter 5, the geometric mean and spread factor have only been calculated in cases where 15 percent or more of the samples were quantified. Otherwise, results for these statistical parameters have been left blank.

Additional symbols utilized in the tables of this appendix are described below:

ND:	Not Detected. Arithmetic mean is reported as ND if all sample concentrations were reported as "ND."
NQ:	Not Quantifiable. Arithmetic Mean is reported as NQ if all sample concentrations were either "ND" or "NQ," but all were not "ND." (Organic chemicals only.)
Not Calculated:	Geometric mean is reported as "Not Calculated" if there were greater than 15 percent of the samples quantified but geometric mean calculation was still not feasible. This only occurred in cases where all quantified results had the same numerical value.

SECTION 1

PROCESS PERFORMANCE
16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)

OVERVIEW

This appendix provides statistical summary tables for the EEWTP process sites during the first alum phase of operation, Phase IA. The data summarized here was collected over a twelve month period between 16 March 1981 and 16 March 1982.

The data are organized by parameter group, as indicated below:

G-1-1	Physical/Aesthetic Parameters
G-1-2	Asbestos Fibers a. Concentration b. Characterization
G-1-3	Major Cations, Anions and Nutrients
G-1-4	Trace Metals
G-1-5	Radiological Parameters
G-1-6	Microbiological Parameters
G-1-7	Viruses
G-1-8	Parasites
G-1-9	Organic Surrogate Parameters - TOC and TOX
G-1-10	Synthetic Organic Chemicals - Halogenated Alkanes
G-1-11	Synthetic Organic Chemicals - Halogenated Alkenes
G-1-12	Synthetic Organic Chemicals - Aromatic Hydrocarbons (Non-Halogenated)
G-1-13	Synthetic Organic Chemicals - Halogenated Aromatics
G-1-14	Synthetic Organic Chemicals - Pesticides/Herbicides
G-1-15	Synthetic Organic Chemicals - Miscellaneous Quantified Organic Chemicals
G-1-16	Organic chemicals Tentatively Identified by Volatile Organic Analysis (Purge and Trap GC/MS)
G-1-17	Organic Chemicals Tentatively Identified by Acid Extraction (w/Methylation) and GC/MS
G-1-18	Organic Chemicals Tentatively Identified by Base/Neutral Extraction and GC/MS
G-1-19	Organic Chemicals Tentatively Identified by Closed Loop Stripping and GC/MS
G-1-20	Ames Test Results

Process Performance
16 March 1981 to 16 March 1982 (Phase IA)

It should be noted that not all of the analyses were conducted for the entire twelve month period. Exceptions are noted on the tables, either with specific text, or with one of the following symbols, either at the location heading or next to the "No. of Samples."

*	Analysis terminated on 1 December 1981
**	Analysis initiated on 1 December 1981
+	Analysis terminated on 16 March 1982
++	Analysis initiated on 16 March 1982

All data reported here are from 24-hour composite samples unless noted otherwise (next to the parameter name). In some cases, a negligible number of composite samples were missed, and grab samples taken in their place are included with the data analysis.

TABLE G-1-1
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
PHYSICAL/AESTHETIC PARAMETERS

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Temperature, deg. C [in-situ readings]						
No. of Readings	365					365
Arithmetic Mean	17.8					18.1
Standard Deviation	7.0					6.9
Median Value	18.0					18.0
Minimum Value	6.0					7.0
Maximum Value	29.0					29.0
pH [grab samples]						
No. of Readings	2024	1742 (Before pH control)	2564 (After pH control; before Cl2 and filtration)		2295	2158
Arithmetic Mean	7.0	6.6	7.4		6.9	6.8
Standard Deviation	0.3	0.4	0.8		0.7	0.5
Geometric Mean	7.0	6.6	7.4		6.9	6.8
Spread Factor	1.04	1.06	1.11		1.10	1.08
Median Value	7.1	6.6	7.3		6.8	6.8
Minimum Value	5.9	5.4	5.9		5.4	5.3
Maximum Value	8.3	8.5	9.7		9.4	9.2
Dissolved Oxygen [grab samples] (MDL=0.15 mg/l)						
No. of Readings	335	288	739	642	707	355
Arithmetic Mean	8.6	9.2	8.7	7.9	7.3	8.1
Standard Deviation	1.5	1.4	1.4	1.6	1.6	1.4
Geometric Mean	8.4	9.1	8.6	7.7	7.1	7.9
Spread Factor	1.20	1.16	1.18	1.24	1.25	1.20
Median Value	8.5	9.0	8.7	7.9	7.3	8.1
Minimum Value	4.9	6.7	4.7	4.0	3.5	4.9
Maximum Value	12.5	12.4	12.3	11.6	11.3	11.3
Turbidity (MDL= 0.05 NTU)						
No. of Samples	253 (*)		255 (*)		257 (*)	257 (*)
No. Above MDL	253		255		257	257
Arithmetic Mean	12.05		0.45		0.38	0.37
Standard Deviation	5.91		0.45		0.51	0.16
Geometric Mean	10.91		0.38		0.32	0.35
Spread Factor	1.63		1.69		1.61	1.36
Median Value	11.00		0.30		0.30	0.30
90% Less Than	18.00		0.70		0.45	0.50
Turbidity [grab samples] (MDL= 0.05 NTU)						
No. of Samples	3917	3344 (After pH control)	4320		2027	3914
No. Above MDL	3917	3344	4319		2026	3910
Arithmetic Mean	13.57	3.49	0.18		0.09	0.12
Standard Deviation	11.91	1.83	0.25		0.09	0.07
Geometric Mean	11.07	3.04	0.13		0.08	0.11
Spread Factor	1.80	1.70	2.05		1.69	1.66
Median Value	11.00	3.10	0.10		0.10	0.10
90% Less Than	22.00	6.00	0.30		0.15	0.20

TABLE G-1-1
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
PHYSICAL/AESTHETIC PARAMETERS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Suspended Solids (TSS)						
(MDL= 3.6 mg/l)						
No. of Samples	203	195	206		208	
No. Above MDL	202	139	13		12	
Arithmetic Mean	15.63	4.97	2.11		2.17	
Standard Deviation	12.00	2.98	1.27		2.49	
Geometric Mean	13.35	4.66				
Spread Factor	1.70	1.62				
Median Value	13.0	5.0	ND		ND	
90% Less Than	26.0	9.0	ND		ND	
Apparent Color						
(MDL= 3 color units)						
No. of Samples	200		202			204
No. Above MDL	200		145			99
Arithmetic Mean	35.6		5.3			3.4
Standard Deviation	13.2		3.9			2.8
Geometric Mean	33.7		4.4			2.9
Spread Factor	1.39		1.99			1.97
Median Value	35		5			ND
90% Less Than	45		10			7
MBAS						
(MDL= 0.03 mg/l)						
No. of Samples	261		12			267
No. Above MDL	259		12			165
Arithmetic Mean	0.068		0.056			0.033
Standard Deviation	0.030		0.021			0.022
Geometric Mean	0.063		0.052			0.032
Spread Factor	1.46		1.43			1.57
Median Value	0.06		0.05			0.03
90% Less Than	0.12		0.08			0.05
Taste						
(MDL= 2 Taste Units)						
No. of Samples						249 (*)
No. Above MDL						248
Arithmetic Mean						29.0
Standard Deviation						25.7
Geometric Mean						20.6
Spread Factor						2.28
Median Value						17
90% Less Than						50
Odor						
(MDL= 1 TON)						
No. of Samples					10 (**)	267
No. Above MDL					10	267
Arithmetic Mean					11.3	22.3
Standard Deviation					6.0	20.6
Geometric Mean					9.9	16.7
Spread Factor					1.72	2.09
Median Value					12	17
90% Less Than					17	50

TABLE G-1-1
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
PHYSICAL/AESTHETIC PARAMETERS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Free Chlorine [grab samples] (MDL= 0.1 mg/l-Cl)						
No. of Samples		988				2438
No. Above MDL		911				2422
Arithmetic Mean		0.36				1.60
Standard Deviation		0.60				0.64
Geometric Mean		0.22				1.39
Spread Factor		2.39				1.96
Median Value		0.2				1.6
90% Less Than		0.7				2.5
Total Chlorine [grab samples] (MDL= 0.1 mg/l-Cl)						
No. of Samples		2001				2434
No. Above MDL		2001				2433
Arithmetic Mean		1.68				1.98
Standard Deviation		1.96				0.65
Geometric Mean		1.27				1.89
Spread Factor		1.85				1.35
Median Value		1.1				1.8
90% Less Than		3.2				2.8

TABLE G-1-2 (A)
PROCESS PERFORMANCE
16 MARCH 1981 TO 16 MARCH 1982
ASBESTOS FIBER CONCENTRATION

CHRYSOTILE FIBERS	EEWTP Blended Influent	Dual Media Filter Effluent**	EEWTP Finished Water
Summary Data:			
Total Number of Samples	49	33	48
Total Volume Filtered, Liters (VT)	0.474	1.625	2.452
Equivalent Volume Examined, Liters (V)	0.0000693	0.0002453	0.0003597
Percent Filter Area Examined (V/VT * 100)	0.01461	0.01510	0.01467
Chrysotile Fiber Results:			
Total Fibers Counted (N)	416	32	9
Max. Concentration, MFL	91.820	1.050	0.585
Min. Concentration, MFL	N.D.	N.D.	N.D.
Median Concentration, MFL	2.926	N.D.	N.D.
90 Percentile Concentration, MFL	13.960	0.525	N.D.
Average Concentration (N/V), MFL	6.007	0.130	0.025
Minimum Detection Limits			
Highest, MFL	1.463	0.262	0.146
Lowest, MFL	0.328	0.131	0.066

AMPHIBOLE FIBERS	EEWTP Blended Influent	Dual Media Filter Effluent**	EEWTP Finished Water
Summary Data:			
Total Number of Samples	8	8	48
Total Volume Filtered, Liters (VT)	0.088	0.375	2.452
Equivalent Volume Examined, Liters (V)	0.0000134	0.0000572	0.0003597
Percent Filter Area Examined (V/VT * 100)	0.01524	0.01524	0.01467
Amphibole Fiber Results:			
Total Fibers Counted (N)	0	0	0
Max. Concentration, MFL	N.D.	N.D.	N.D.
Min. Concentration, MFL	N.D.	N.D.	N.D.
Median Concentration, MFL	N.D.	N.D.	N.D.
90 Percentile Concentration, MFL	N.D.	N.D.	N.D.
Average Concentration (N/V), MFL	N.D.	N.D.	N.D.
Minimum Detection Limits			
Highest, MFL	1.312	0.262	0.146
Lowest, MFL	0.328	0.131	0.066

** Sampling terminated on 1 December 1981.

TABLE G-1-2 (B)
PROCESS PERFORMANCE
16 MARCH 1981 TO 16 MARCH 1982
ASBESTOS FIBER CHARACTERIZATION

	EEWTP Blend Tank	Dual Media Filter Effluent**	EEWTP Finished Water
Chrysotile Fiber Results:			
Number of Fibers Examined *	372	10	0
Length Distribution, Fibers/Samples			
0.0 - 0.49 um	51/13	0/0	0/0
0.50 - 0.9 um	166/21	4/2	0/0
1.0 - 1.4 um	74/21	1/1	0/0
1.5 - 1.9 um	39/17	3/2	0/0
2.0 - 2.4 um	16/8	1/1	0/0
> 2.5 um	26/14	1/1	0/0
Width Distribution, Fibers/Samples			
0.00 - 0.04 um	43/12	0/0	0/0
0.05 - 0.09 um	292/21	6/2	0/0
0.10 - 0.14 um	29/11	3/2	0/0
0.15 - 0.19 um	5/3	0/0	0/0
0.20 - 0.24 um	1/1	1/1	0/0
> 2.5 um	2/2	0/0	0/0
Aspect Ratio Distribution, Fibers/Samples			
0.0 - 9.0	74/14	2/2	0/0
10.0 - 19.9	170/21	5/2	0/0
20.0 - 29.9	65/17	3/1	0/0
30.0 - 39.9	32/13	0/0	0/0
40.0 - 49.9	14/9	0/0	0/0
> 50.0	17/10	0/0	0/0
Amphibole Fibers:			
Number of Fibers Examined *	0	0	0
Length Distribution, Fibers/Samples			
0.0 - 0.49 um	0/0	0/0	0/0
0.50 - 0.9 um	0/0	0/0	0/0
1.0 - 1.4 um	0/0	0/0	0/0
1.5 - 1.9 um	0/0	0/0	0/0
2.0 - 2.4 um	0/0	0/0	0/0
> 2.5 um	0/0	0/0	0/0
Width Distribution, Fibers/Samples			
0.00 - 0.04 um	0/0	0/0	0/0
0.05 - 0.09 um	0/0	0/0	0/0
0.10 - 0.14 um	0/0	0/0	0/0
0.15 - 0.19 um	0/0	0/0	0/0
0.20 - 0.24 um	0/0	0/0	0/0
> 2.5 um	0/0	0/0	0/0
Aspect Ratio Distribution, Fibers/Samples			
0.0 - 9.0	0/0	0/0	0/0
10.0 - 19.9	0/0	0/0	0/0
20.0 - 29.9	0/0	0/0	0/0
30.0 - 39.9	0/0	0/0	0/0
40.0 - 49.9	0/0	0/0	0/0
> 50.0	0/0	0/0	0/0

* Only those fibers from samples with 5 or more fibers were used.
** Sampling terminated on 1 December 1981.

TABLE G-1-3
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MAJOR CATIONS, ANIONS, AND NUTRIENTS

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Dissolved Solids (TDS): by evaporation (MDL=10.0 mg/l)					
No. of Samples	183 (*)				189 (*)
No. Above MDL	183				189
Arithmetic Mean	268.3				278.5
Standard Deviation	45.5				51.4
Geometric Mean	264.3				273.7
Spread Factor	1.19				1.21
Median Value	266				273
90% Less Than	328				349
Total Dissolved Solids (TDS): by addition (MDL= 1 mg/l)					
No. of Samples	25 (**)		26 (**)		27 (**)
No. Above MDL	25		26		27
Arithmetic Mean	240.6		288.3		301.4
Standard Deviation	52.3		42.0		35.1
Geometric Mean	234.4		285.4		299.4
Spread Factor	1.27		1.15		1.12
Median Value	232		274		293
90% Less Than	300		349		353
Electroconductivity [grab samples at blended influent, composites elsewhere) (MDL= 0.1 umho/cm)					
No. of Samples	2107		27 (**)		201
No. Above MDL	2107		27		201
Arithmetic Mean	451.3		521.3		470.4
Standard Deviation	66.1		74.6		71.8
Geometric Mean	446.1		516.2		464.8
Spread Factor	1.17		1.15		1.17
Median Value	450.0		510.0		470.0
90% Less Than	530.0		620.0		570.0
Calcium (MDL= 0.2 mg/l)					
No. of Samples	276	24 (**)	278	24 (**)	281
No. Above MDL	276	24	278	24	281
Arithmetic Mean	46.36	56.44	48.83	55.55	48.75
Standard Deviation	8.26	7.53	10.00	8.00	10.23
Geometric Mean	45.62	55.96	47.81	54.98	47.18
Spread Factor	1.20	1.14	1.23	1.16	1.40
Median Value	45.7	54.9	47.6	56.1	47.1
90% Less Than	57.6	66.6	62.9	65.3	63.8
Hardness: by addition (Ca+Mg, as CaCO3) (MDL= 1.0 mg/l-CaCO3)					
No. of Samples	276	24 (**)	278	24 (**)	280
No. Above MDL	276	24	278	24	280
Arithmetic Mean	149.4	169.7	155.4	167.8	155.4
Standard Deviation	25.7	22.4	29.6	23.9	30.8
Geometric Mean	147.2	168.3	152.6	166.2	150.7
Spread Factor	1.19	1.14	1.21	1.15	1.39
Median Value	147	164	153	[illegible]	153
90% Less Than	183	201	198	197	199

TABLE G-1-3
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Magnesium					
(MDL= 0.1 mg/l)					
No. of Samples	276	24 (**)	278	24 (**)	280
No. Above MDL	276	24	278	24	280
Arithmetic Mean	8.18	7.00	8.13	7.08	8.16
Standard Deviation	1.63	0.96	1.66	1.14	1.78
Geometric Mean	8.01	6.94	7.96	6.99	7.88
Spread Factor	1.22	1.14	1.23	1.17	1.40
Median Value	8.0	6.7	7.9	6.9	7.9
90% Less Than	10.4	8.5	10.4	8.5	10.5
Potassium					
(MDL= 0.3 mg/l)					
No. of Samples	276	24 (**)	278	25 (**)	281
No. Above MDL	276	24	278	25	280
Arithmetic Mean	6.02	5.42	6.13	5.56	6.14
Standard Deviation	1.04	0.70	1.10	0.72	1.16
Geometric Mean	5.92	5.38	6.02	5.51	5.98
Spread Factor	1.22	1.14	1.23	1.14	1.31
Median Value	6.0	5.5	6.1	5.6	6.1
90% Less Than	7.1	6.3	7.3	6.5	7.4
Sodium					
(MDL= 0.1 mg/l)					
No. of Samples	276	24 (**)	278	24 (**)	281
No. Above MDL	276	24	278	24	281
Arithmetic Mean	29.80	34.00	29.51	33.21	29.80
Standard Deviation	6.46	10.10	6.29	8.36	6.70
Geometric Mean	29.10	32.78	28.84	32.36	28.73
Spread Factor	1.25	1.30	1.24	1.25	1.42
Median Value	29.2	31.6	29.3	31.6	29.8
90% Less Than	37.1	50.1	37.3	39.6	37.4
Alkalinity					
(MDL= 2.7 mg/l-CaCO3)					
No. of Samples	274		27 (**)		282
No. Above MDL	274		27		282
Arithmetic Mean	60.68		54.03		42.29
Standard Deviation	17.12		17.56		19.44
Geometric Mean	58.14		51.29		37.69
Spread Factor	1.35		1.39		1.64
Median Value	59.0		51.0		37.6
90% Less Than	85.0		74.0		71.0
Bromide					
(MDL= 0.003 mg/l)					
No. of Samples	272		27 (**)		282
No. Above MDL	265		25		115
Arithmetic Mean	0.0704		0.0415		0.0113
Standard Deviation	0.0364		0.0293		0.0168
Geometric Mean	0.0574		0.0298		0.0022
Spread Factor	2.18		2.62		8.81
Median Value	0.065		0.030		ND
90% Less Than	0.120		0.094		0.035

TABLE G-1-3
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chloride					
(MDL= 0.1 mg/l)					
No. of Samples	275		27 (**)		284
No. Above MDL	275		27		284
Arithmetic Mean	43.84		60.44		47.73
Standard Deviation	11.07		13.79		11.44
Geometric Mean	42.43		59.07		46.37
Spread Factor	1.30		1.23		1.28
Median Value	44.0		58.1		48.0
90% Less Than	57.0		84.0		60.5
Cyanide, Total					
(MDL= 0.005 mg/l)					
No. of Samples	283				283
No. Above MDL	180				75
Arithmetic Mean	0.0083				0.0054
Standard Deviation	0.0071				0.0098
Geometric Mean	0.0064				0.0024
Spread Factor	2.17				3.32
Median Value	0.006				ND
90% Less Than	0.020				0.011
Fluoride					
(MDL= 0.10 mg/l)					
No. of Samples	273		27 (**)		283
No. Above MDL	270		27		277
Arithmetic Mean	0.51		0.29		0.32
Standard Deviation	0.13		0.09		0.12
Geometric Mean	0.49		0.28		0.30
Spread Factor	1.39		1.32		1.44
Median Value	0.5		0.3		0.3
90% Less Than	0.6		0.4		0.4
Iodide					
(MDL= 0.002 mg/l)					
No. of Samples	246 (*)				252 (*)
No. Above MDL	237				218
Arithmetic Mean	0.0054				0.0036
Standard Deviation	0.0024				0.0019
Geometric Mean	0.0048				0.0032
Spread Factor	1.65				1.66
Median Value	0.006				0.003
90% Less Than	0.008				0.006
Nitrogen, Nitrite + Nitrate					
(MDL= 0.02 mg/l-N)					
No. of Samples	276		27 (**)	276	285
No. Above MDL	276		27	276	284
Arithmetic Mean	7.26		6.71	7.38	7.36
Standard Deviation	1.97		1.77	2.25	2.13
Geometric Mean	6.90		6.47	6.95	6.87
Spread Factor	1.43		1.33	1.47	1.65
Median Value	7.5		7.0	7.6	7.6
90% Less Than	9.1		8.9	9.3	9.3

TABLE G-1-3
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Nitrogen, Ammonia (MDL= 0.02 mg/l-N)					
No. of Samples	277		27 (**)	276	285
No. Above MDL	251		26	118	65
Arithmetic Mean	0.262		0.546	0.115	0.069
Standard Deviation	0.394		0.487	0.271	0.211
Geometric Mean	0.128		0.292	0.013	0.002
Spread Factor	3.36		3.84	9.49	15.96
Median Value	0.13		0.40	ND	ND
90% Less Than	0.82		1.30	0.34	0.06
Nitrogen, Total Kjeldahl (MDL= 0.2 mg/l-N)					
No. of Samples	269		27 (**)	28 (**)	30 (**)
No. Above MDL	253		27	23	21
Arithmetic Mean	0.97		0.85	0.48	0.35
Standard Deviation	0.57		0.49	0.38	0.27
Geometric Mean	0.82		0.71	0.38	0.29
Spread Factor	1.90		1.85	2.05	2.02
Median Value	0.9		0.8	0.3	0.3
90% Less Than	1.8		1.7	1.2	0.8
Ortho Phosphate (MDL= 0.01 mg/l-P)					
No. of Samples	275		27 (**)	276	285
No. Above MDL	275		6	48	27
Arithmetic Mean	0.423		0.018	0.020	0.013
Standard Deviation	0.351		0.039	0.094	0.053
Geometric Mean	0.347		0.002	0.001	
Spread Factor	1.81		10.25	13.17	
Median Value	0.33		ND	ND	ND
90% Less Than	0.70		0.05	0.03	ND
Silica (MDL= 0.2 mg/l)					
No. of Samples	276		27 (**)		283
No. Above MDL	276		27		283
Arithmetic Mean	6.87		6.19		5.77
Standard Deviation	2.16		1.56		1.88
Geometric Mean	6.49		5.95		5.43
Spread Factor	1.43		1.35		1.45
Median Value	6.9		6.4		5.7
90% Less Than	9.6		7.9		8.4
Sulfate (MDL= 0.6 mg/l)					
No. of Samples	276		27 (**)		284
No. Above MDL	276		27		284
Arithmetic Mean	67.29		80.53		92.70
Standard Deviation	14.29		12.35		17.37
Geometric Mean	65.76		79.71		91.10
Spread Factor	1.24		1.15		1.20
Median Value	64.4		76.0		90.0
90% Less Than	87.0		99.0		118.9

TABLE G-1-4
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
TRACE METALS

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent	Final Carbon Column Effluent (**)	EEWTP Finished Water
Aluminum (MDL= 0.003 mg/l)					
No. of Samples	273	24	276	24	279
No. Above MDL	266	24	259	24	226
Arithmetic Mean	0.4431	1.4454	0.1094	0.0813	0.0777
Standard Deviation	0.4014	0.3442	0.1420	0.0654	0.3339
Geometric Mean	0.3166	1.4024	0.0586	0.0577	0.0187
Spread Factor	2.85	1.29	3.56	2.38	4.98
Median Value	0.373	1.44	0.060	0.070	0.020
90% Less Than	0.740	1.84	0.240	0.160	0.090
Antimony (MDL= 0.0003 mg/l)					
No. of Samples	273	21	275	22	278
No. Above MDL	90	6	128	8	133
Arithmetic Mean	0.00059	0.00020	0.00058	0.00024	0.00070
Standard Deviation	0.00172	0.00009	0.00147	0.00014	0.00180
Geometric Mean	0.00014	0.00025	0.00025	0.00026	0.00025
Spread Factor	4.40	1.27	3.09	1.50	3.50
Median Value	ND	ND	ND	ND	ND
90% Less Than	0.0006	0.0003	0.0008	0.0004	0.0009
Arsenic (MDL= 0.0002 mg/l)					
No. of Samples	274	23	277	24	279
No. Above MDL	244	18	154	15	148
Arithmetic Mean	0.00130	0.00073	0.00107	0.00037	0.00094
Standard Deviation	0.00333	0.00098	0.00473	0.00056	0.00327
Geometric Mean	0.00065	0.00043	0.00021	0.00022	0.00021
Spread Factor	2.63	2.72	4.34	2.57	4.66
Median Value	0.0007	0.0004	0.0002	0.0002	0.0002
90% Less Than	0.0015	0.0025	0.0009	0.0010	0.0009
Barium (MDL= 0.002 mg/l)					
No. of Samples	271	22	274	22	276
No. Above MDL	264	22	262	22	275
Arithmetic Mean	0.0319	0.0242	0.0229	0.0191	0.0238
Standard Deviation	0.0103	0.0035	0.0079	0.0051	0.0080
Geometric Mean	0.0291	0.0240	0.0206	0.0185	0.0215
Spread Factor	1.74	1.15	1.80	1.26	1.78
Median Value	0.032	0.023	0.023	0.018	0.024
90% Less Than	0.045	0.029	0.031	0.023	0.032
Beryllium (MDL= 0.0008 mg/l)					
No. of Samples	272	21	274	22	278
No. Above MDL	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND

TABLE G-1-4
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent	Final Carbon Column Effluent (**)	EEWTP Finished Water
Boron (MDL= 0.0040 mg/l)					
No. of Samples	274	24	277	24	279
No. Above MDL	272	24	272	24	270
Arithmetic Mean	0.05104	0.06433	0.04480	0.05473	0.04208
Standard Deviation	0.04070	0.03468	0.02315	0.01401	0.02624
Geometric Mean	0.03930	0.05936	0.03658	0.05321	0.03349
Spread Factor	2.23	1.43	2.11	1.26	2.21
Median Value	0.0519	0.0575	0.0465	0.0510	0.0442
90% Less Than	0.0783	0.0818	0.0704	0.0663	0.0648
Cadmium: ICAP (MDL= 0.0008 mg/l)					
No. of Samples	250 (*)		252 (*)		253 (*)
No. Above MDL	54		33		33
Arithmetic Mean	0.00062		0.00054		0.00052
Standard Deviation	0.00058		0.00052		0.00037
Geometric Mean	0.00041				
Spread Factor	2.30				
Median Value	ND		ND		ND
90% Less Than	0.0012		0.0008		0.0010
Cadmium: furnace AAS (MDL= 0.0002 mg/l)					
No. of Samples	22 (**)	23 (**)	23 (**)	24 (**)	26 (**)
No. Above MDL	7	1	3	2	2
Arithmetic Mean	0.00029	0.00010	0.00018	0.00012	0.00013
Standard Deviation	0.00056	0.00002	0.00021	0.00009	0.00011
Geometric Mean	0.00010				
Spread Factor	4.03				
Median Value	ND	ND	ND	ND	ND
90% Less Than	0.0011	ND	0.0006	ND	ND
Chromium: ICAP (MDL= 0.003 mg/l)					
No. of Samples	250 (*)		252 (*)		253 (*)
No. Above MDL	78		10		6
Arithmetic Mean	0.0025		0.0016		0.0016
Standard Deviation	0.0019		0.0006		0.0005
Geometric Mean	0.0022				
Spread Factor	1.84				
Median Value	ND		ND		ND
90% Less Than	0.005		ND		ND
Chromium: furnace AAS (MDL= 0.0002 mg/l)					
No. of Samples	22 (**)	24 (**)	24 (**)	24 (**)	26 (**)
No. Above MDL	21	23	19	19	17
Arithmetic Mean	0.01003	0.00156	0.00090	0.00095	0.00100
Standard Deviation	0.01758	0.00074	0.00061	0.00076	0.00096
Geometric Mean	0.00443	0.00136	0.00066	0.00064	0.00047
Spread Factor	3.76	1.83	2.57	2.78	4.30
Median Value	0.0043	0.0014	0.0009	0.0007	0.0007
90% Less Than	0.011	0.0028	0.0016	0.0024	0.0024

TABLE G-1-4
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent	Final Carbon Column Effluent (**)	EEWTP Finished Water
Cobalt: ICAP					
(MDL= 0.003 mg/l)					
No. of Samples	251 (*)		253 (*)		253 (*)
No. Above MDL	8		6		6
Arithmetic Mean	0.0016		0.0016		0.0016
Standard Deviation	0.0005		0.0005		0.0007
Median Value	ND		ND		ND
90% Less Than	ND		ND		ND
Cobalt: furnace AAS					
(MDL= 0.0001 mg/l)					
No. of Samples	22 (**)	22 (**)	22 (**)	22 (**)	25 (**)
No. Above MDL	22	21	20	20	20
Arithmetic Mean	0.00518	0.00166	0.00082	0.00057	0.00055
Standard Deviation	0.00542	0.00119	0.00050	0.00053	0.00057
Geometric Mean	0.00374	0.00123	0.00064	0.00044	0.00035
Spread Factor	2.13	2.47	2.27	2.15	2.84
Median Value	0.0032	0.0011	0.0006	0.0005	0.0005
90% Less Than	0.009	0.0035	0.0016	0.0008	0.0008
Copper: ICAP					
(MDL= 0.0008 mg/l)					
No. of Samples	251 (*)		253 (*)		253 (*)
No. Above MDL	240		201		174
Arithmetic Mean	0.00755		0.00379		0.00327
Standard Deviation	0.00532		0.00420		0.0087[illegible]
Geometric Mean	0.00609		0.00233		0.00157
Spread Factor	2.07		2.91		3.22
Median Value	0.0068		0.0028		0.0019
90% Less Than	0.0129		0.0078		0.0062
Copper: flame AAS					
(MDL= 0.0012 mg/l)					
No. of Samples	23 (**)	24 (**)	24 (**)	24 (**)	26 (**)
No. Above MDL	23	24	22	17	20
Arithmetic Mean	0.00981	0.00965	0.00359	0.00224	0.00440
Standard Deviation	0.00484	0.00727	0.00181	0.00201	0.00596
Geometric Mean	0.00878	0.00807	0.00315	0.00176	0.00249
Spread Factor	1.61	1.76	1.77	2.06	2.88
Median Value	0.0087	0.0074	0.0039	0.0018	0.0023
90% Less Than	0.0168	0.0140	0.0057	0.0038	0.0094
Iron					
(MDL= 0.003 mg/l)					
No. of Samples	272	24	276	24	279
No. Above MDL	271	24	251	21	240
Arithmetic Mean	1.3756	0.3457	0.0662	0.0278	0.1153
Standard Deviation	0.9030	0.1003	0.1288	0.0438	0.5421
Geometric Mean	1.0915	0.3138	0.0324	0.0141	0.0248
Spread Factor	2.32	1.81	3.52	3.30	4.51
Median Value	1.160	0.356	0.037	0.016	0.032
90% Less Than	2.270	0.431	0.110	0.040	0.091

TABLE G-1-4
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent	Final Carbon Column Effluent (**)	EEWTP Finished Water
Lead					
(MDL= 0.0003 mg/l)					
No. of Samples	273	23	277	24	279
No. Above MDL	246	8	159	9	153
Arithmetic Mean	0.00256	0.00044	0.00073	0.00031	0.00097
Standard Deviation	0.00320	0.00054	0.00128	0.00028	0.00260
Geometric Mean	0.00158	0.00018	0.00036	0.00023	0.00033
Spread Factor	2.80	3.95	3.19	2.19	3.86
Median Value	0.0018	ND	0.0004	ND	0.0003
90% Less Than	0.0046	0.0015	0.0015	0.0005	0.0016
Lithium: ICAP					
(MDL= 0.0010 mg/l)					
No. of Samples	251 (*)		253 (*)		251 (*)
No. Above MDL	249		245		242
Arithmetic Mean	0.00567		0.00454		0.00495
Standard Deviation	0.00620		0.00191		0.00536
Geometric Mean	0.00494		0.00413		0.00404
Spread Factor	1.59		1.62		1.82
Median Value	0.0053		0.0046		0.0042
90% Less Than	0.0073		0.0064		0.0070
Lithium: flame AAS					
(MDL= 0.0004 mg/l)					
No. of Samples	23 (**)	24 (**)	24 (**)	24 (**)	26 (**)
No. Above MDL	22	23	23	23	24
Arithmetic Mean	0.00499	0.00634	0.00409	0.00638	0.00651
Standard Deviation	0.00158	0.01043	0.00160	0.01078	0.00841
Geometric Mean	0.00451	0.00426	0.00362	0.00408	0.00414
Spread Factor	1.81	2.19	1.84	2.35	2.69
Median Value	0.0050	0.0040	0.0042	0.0044	0.0046
90% Less Than	0.0069	0.0070	0.0060	0.0073	0.0069
Manganese					
(MDL= 0.0010 mg/l)					
No. of Samples	274	30	280	26	279
No. Above MDL	274	30	278	23	279
Arithmetic Mean	0.19493	0.20898	0.05848	0.01715	0.05188
Standard Deviation	0.11901	0.02986	0.05018	0.03304	0.07248
Geometric Mean	0.16456	0.20691	0.04263	0.00455	0.03051
Spread Factor	1.82	1.15	2.37	5.12	2.99
Median Value	0.1700	0.2080	0.0460	0.0037	0.0380
90% Less Than	0.3290	0.2500	0.1320	0.0553	0.1200
Mercury					
(MDL= 0.00027 mg/l)					
No. of Samples	267	23	274	24	279
No. Above MDL	64	5	105	5	103
Arithmetic Mean	0.00057	0.00034	0.00033	0.00049	0.00032
Standard Deviation	0.00439	0.00057	0.00041	0.00131	0.00041
Geometric Mean	0.00009	0.00006	0.00020	0.00004	0.00020
Spread Factor	4.36	6.29	2.69	9.66	2.71
Median Value	ND	ND	ND	ND	ND
90% Less Than	0.0005	0.0006	0.0006	0.0007	0.0007

TABLE G-1-4
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent	Final Carbon Column Effluent (**)	EEWTP Finished Water
Molybdenum (MDL= 0.002 mg/l)					
No. of Samples	271	19	272	20	276
No. Above MDL	12	1	33	0	24
Arithmetic Mean	0.0012	0.0011	0.0013	ND	0.0012
Standard Deviation	0.0013	0.0003	0.0010		0.0008
Median Value	ND	ND	ND	ND	ND
90% Less Than	ND	ND	0.002	ND	ND
Nickel (MDL= 0.0010 mg/l)					
No. of Samples	268	24	275	24	276
No. Above MDL	253	22	216	22	218
Arithmetic Mean	0.00468	0.00396	0.00306	0.00255	0.00329
Standard Deviation	0.00256	0.00147	0.00210	0.00123	0.00330
Geometric Mean	0.00405	0.00364	0.00243	0.00231	0.00239
Spread Factor	1.80	1.65	2.17	1.64	2.34
Median Value	0.0043	0.0042	0.0029	0.0023	0.0028
90% Less Than	0.0076	0.0054	0.0053	0.0044	0.0058
Selenium (MDL= 0.0002 mg/l)					
No. of Samples	274	23	277	24	279
No. Above MDL	176	4	175	9	194
Arithmetic Mean	0.00111	0.00015	0.00102	0.00030	0.00115
Standard Deviation	0.00199	0.00013	0.00135	0.00044	0.00137
Geometric Mean	0.00039	0.00008	0.00040	0.00013	0.00051
Spread Factor	4.92	2.66	4.84	3.52	4.32
Median Value	0.0004	ND	0.0005	ND	0.0007
90% Less Than	0.0029	0.0003	0.0027	0.0006	0.0027
Silver: flame AAS (MDL= 0.0008 mg/l)					
No. of Samples	251 (*)		253 (*)		253 (*)
No. Above MDL	37		8		10
Arithmetic Mean	0.00052		0.00045		0.00044
Standard Deviation	0.00038		0.00033		0.00032
Median Value	ND		ND		ND
90% Less Than	0.0008		ND		ND
Silver: furnace AAS (MDL= 0.0002 mg/l)					
No. of Samples	23 (**)	23 (**)	24 (**)	24 (**)	26 (**)
No. Above MDL	21	6	1	2	0
Arithmetic Mean	0.00096	0.00016	0.00012	0.00016	ND
Standard Deviation	0.00074	0.00014	0.00008	0.00027	
Geometric Mean	0.00070	0.00012			
Spread Factor	2.37	2.03			
Median Value	0.0008	ND	ND	ND	ND
90% Less Than	0.0018	0.0002	ND	ND	ND

TABLE G-1-4
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent	Final Carbon Column Effluent (**)	EEWTP Finished Water
Thallium (MDL= 0.0009 mg/l)					
No. of Samples	273	21	275	22	278
No. Above MDL	2	0	3	0	6
Arithmetic Mean	0.00045	ND	0.00046	ND	0.00047
Standard Deviation	0.00004		0.00014		0.00016
Median Value	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND
Tin (MDL= 0.0040 mg/l)					
No. of Samples	270	19	272	20	275
No. Above MDL	79	4	84	8	58
Arithmetic Mean	0.00373	0.00291	0.00469	0.00357	0.00412
Standard Deviation	0.00435	0.00192	0.00545	0.00231	0.00769
Geometric Mean	0.00248	0.00236	0.00220	0.00350	0.00128
Spread Factor	2.40	1.97	3.38	1.66	4.11
Median Value	ND	ND	ND	ND	ND
90% Less Than	0.0075	0.0069	0.0140	0.0065	0.0076
Titanium (MDL= 0.0020 mg/l)					
No. of Samples	271	22	274	22	277
No. Above MDL	233	14	9	0	5
Arithmetic Mean	0.0105	0.0040	0.0013	ND	0.0011
Standard Deviation	0.0084	0.0034	0.0022		0.0015
Geometric Mean	0.0075	0.0029			
Spread Factor	2.52	2.35			
Median Value	0.009	0.003	ND	ND	ND
90% Less Than	0.020	0.007	ND	ND	ND
Vanadium (MDL= 0.0020 mg/l)					
No. of Samples	272	21	275	22	277
No. Above MDL	199	1	132	3	156
Arithmetic Mean	0.00479	0.00107	0.00453	0.00260	0.00515
Standard Deviation	0.00585	0.00031	0.01110	0.00479	0.00733
Geometric Mean	0.00333		0.00183		0.00249
Spread Factor	2.34		3.64		3.48
Median Value	0.0032	ND	ND	ND	0.0024
90% Less Than	0.0094	ND	0.0098	0.0052	0.0120
Zinc: ICAP (MDL= 0.0020 mg/l)					
No. of Samples	250 (*)		253 (*)		252 (*)
No. Above MDL	250		244		252
Arithmetic Mean	0.02399		0.01542		0.06529
Standard Deviation	0.02160		0.01336		0.02786
Geometric Mean	0.02085		0.01145		0.05913
Spread Factor	1.63		2.21		1.59
Median Value	0.0213		0.0120		0.0624
90% Less Than	0.0350		0.0320		0.1007

TABLE G-1-4
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent	Final Carbon Column Effluent (**)	EEWTP Finished Water
Zinc: flame AAS (MDL= 0.0012 mg/l)					
No. of Samples	23 (**)	24 (**)	24 (**)	24 (**)	26 (**)
No. Above MDL	23	24	22	24	26
Arithmetic Mean	0.03355	0.02690	0.00835	0.00845	0.03033
Standard Deviation	0.01427	0.01099	0.00504	0.00619	0.03462
Geometric Mean	0.03070	0.02516	0.00654	0.00691	0.02183
Spread Factor	1.54	1.42	2.26	1.89	2.04
Median Value	0.0328	0.0230	0.0080	0.0075	0.0180
90% Less Than	0.0497	0.0473	0.0140	0.0130	0.0646

TABLE G-1-5
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
RADIOLOGICAL PARAMETERS

	Blended Influent	Dual Media Filter Effluent	EEWTP Finished Water
Gross Alpha (MDL= 0.1 pCi/l)			
No. of Samples	46	35 (*)	45
No. Above MDL	32	16	22
Arithmetic Mean	0.60	0.20	0.28
Standard Deviation	0.67	0.23	0.48
Geometric Mean	0.25	0.09	0.10
Spread Factor	4.79	3.86	4.54
Median Value	0.2	ND	ND
90% Less Than	1.7	0.6	0.6
Gross Alpha 2s Error (MDL= 0.1 pCi/l)			
No. of Samples	39	28 (*)	38
No. Above MDL	39	28	38
Arithmetic Mean	0.67	0.56	0.56
Standard Deviation	0.36	0.26	0.22
Geometric Mean	0.58	0.50	0.51
Spread Factor	1.71	1.66	1.49
Median Value	0.6	0.5	0.5
90% Less Than	1.0	1.0	0.9
Gross Beta (MDL= 0.1 pCi/l)			
No. of Samples	47	36 (*)	46
No. Above MDL	42	34	46
Arithmetic Mean	6.35	6.71	6.82
Standard Deviation	4.84	4.39	3.59
Geometric Mean	3.23	4.62	5.93
Spread Factor	5.50	3.31	1.74
Median Value	6.2	5.9	5.9
90% Less Than	13.0	13.0	12.0
Gross Beta 2s Error (MDL= 0.1 pCi/l)			
No. of Samples	40	29 (*)	39
No. Above MDL	40	29	39
Arithmetic Mean	2.10	2.32	2.14
Standard Deviation	0.94	0.85	1.02
Geometric Mean	1.92	2.16	1.92
Spread Factor	1.52	1.46	1.61
Median Value	2.0	2.2	2.0
90% Less Than	3.9	3.7	3.8
Strontium-90 (Note: Analyzed only for selected dates where Gross Beta + 2 sigma > 8 pCi/L at plant sites) (MDL= 0.2 pCi/l)			
No. of Samples	16	10 (*)	11
No. Above MDL	9	8	7
Arithmetic Mean	1.02	2.38	1.11
Standard Deviation	1.73	2.01	0.83
Geometric Mean	0.05	1.26	0.55
Spread Factor	25.71	4.25	4.67
Median Value	0.02	2.2	1.5
90% Less Than	2.7	4.1	1.9

TABLE G-1-5
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
RADIOLOGICAL PARAMETERS
(Continued)

	Blended Influent	Dual Media Filter Effluent	EEWTP Finished Water
Strontium-90 2s error (MDL= 0.2 pCi/l)			
No. of Samples	16	10 (*)	11
No. Above MDL	16	10	11
Arithmetic Mean	0.51	0.63	0.38
Standard Deviation	0.22	0.37	0.12
Geometric Mean	0.46	0.51	0.37
Spread Factor	1.54	2.02	1.42
Median Value	0.5	0.5	0.4
90% Less Than	0.9	1.1	0.5

TABLE G-1-6
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MICROBIOLOGICAL PARAMETERS

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Coliform (confirmed): 1000,100,10 ml volumes [grab samples] (MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)				
No. of Samples				255
No. of Positives				181
No. of TNTC				0
Geometric Mean				0.0314
Spread Factor				3.22
Median Value				0.020
90% Less Than				0.140
Maximum Value				0.490
Total Coliform (confirmed): 100,10,1 ml volumes [grab samples] (MDL=0.18 MPN/100 ml;UQL=240 MPN/100 ml)				
No. of Samples		15 (**)	223	
No. of Positives		8	221	
No. of TNTC		0	1	
Geometric Mean		0.195	3.157	
Spread Factor		3.95	3.45	
Median Value		0.20	3.30	
90% Less Than		1.10	13.00	
Maximum Value		2.70	>UQL	
Total Coliform (confirmed): 0.1,0.01,0.001 ml volumes [grab samples] (MDL=180 MPN/100 ml;UQL=240000 MPN/100 m)				
No. of Samples	15 (**)			
No. of Positives	15			
No. of TNTC	1			
Geometric Mean	63553.2			
Spread Factor	3.03			
Median Value	54000			
90% Less Than	350000			
Maximum Value	>UQL			
Total Coliform (completed): 1000,100,10 ml volumes [grab samples] (MDL=0.018 MPN/100 ml; UQL=24 MPN/100 ml)				
No. of Samples			(Note: analysis began on	88
No. of Positives			8 October, 1981)	36
No. of TNTC				0
Geometric Mean				0.0135
Spread Factor				3.13
Median Value				ND
90% Less Than				0.068
Maximum Value				0.200
Fecal Coliform (confirmed): 1000,100,10 ml volumes [grab samples] (MDL=0.018 MPN/100 mlUQL=24 MPN/100 ml)				
No. of Samples				187 (*)
No. of Positives				25
No. of TNTC				0
Median Value				ND
90% Less Than				0.020
Maximum Value				0.080

TABLE G-1-6
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MICROBIOLOGICAL PARAMETERS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Fecal Coliform (confirmed): 100,10,1 ml volumes [grab samples] (MDL=0.18 MPN/100 ml;UQL=240 MPN/100 ml)				
No. of Samples			183 (*)	
No. of Positives			58	
No. of TNTC			0	
Geometric Mean			0.077	
Spread Factor			4.61	
Median Value			ND	
90% Less Than			0.45	
Maximum Value			24.00	
Standard Plate Count: 1 ml volume [grab samples] (MDL=1.0 colonies/ml)				
No. of Samples		16 (**)	186	258
No. of Positives		14	175	58
Geometric Mean		6.1	120.1	0.2
Spread Factor		3.98	12.50	8.46
Median Value		11	140	ND
90% Less Than		22	2800	2
Maximum Value		34	7700	300
Standard Plate Count: 0.01 ml volume [grab samples] (MDL=100 colonies/ml)				
No. of Samples	14 (**)			
No. of Positives	14			
Geometric Mean	28677.4			
Spread Factor	2.92			
Median Value	32000			
90% Less Than	80000			
Maximum Value	500000			
Salmonella: 1000 ml volume [grab samples] (MDL=0.022 MPN/100 ml;UQL= 0.16 MPN/100 ml)				
No. of Samples			8	10
No. of Positives			0	0
No. of TNTC			0	0
Median Value			ND	ND
90% Less Than			ND	ND
Maximum Value			ND	ND
Salmonella: 100 ml volume [grab samples] (MDL=0.22 MPN/100 ml;UQL= 1.6 MPN/100 ml)				
No. of Samples	4 (**)			
No. of Positives	4			
No. of TNTC	0			
Geometric Mean	0.637			
Spread Factor	2.09			
Median Value	0.51			
90% Less Than	1.60			
Maximum Value	1.60			

TABLE G-1-6
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MICROBIOLOGICAL PARAMETERS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Endotoxin [grab samples] (MDL=0.006 ng/ml)				
No. of Samples	1 (**)		8	9
No. Above MDL	1		8	9
Arithmetic Mean	62.4000		4.8438	4.9878
Standard Deviation			4.1424	4.7600
Geometric Mean	62.4000		3.6355	2.8688
Spread Factor			2.09	3.16
Median Value	62.400		2.500	5.000
90% Less Than	62.400		12.500	12.500

TABLE G-1-7
PROCESS PERFORMANCE
16 MARCH 1981 TO 16 MARCH 1982
VIRUS ASSAY

Sampling Date	Volume Filtered (Gallons)	Cell Line	Lower Detection Limit (MPNCU/Gallon)	Concentration (MPNCU/Gallon)
EEWTP Blended Influent (See Table F-7 for Results)				
Dual Media Filter Effluent				
25-Apr-1981	1000.0	BGM cell line	.002	N.D.
		RD cell line	.002	N.D.
28-May-1981	1000.0	BGM cell line	.002	N.D.
		RD cell line	.002	N.D.
6-Jul-1981	1000.0	BGM cell line	.002	N.D.
		RD cell line	.002	N.D.
13-Jul-1981	1001.0	BGM cell line	.010	N.D.
		MA104 cell line	.006	N.D.
24-Aug-1981	887.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
11-Oct-1981	1000.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
26-Oct-1981	600.0	BGM cell line	.008	N.D.
		MA104 cell line	.008	N.D.
15-Dec-1981	758.0	BGM cell line	.008	N.D.
		MA104 cell line	.006	N.D.
15-Jan-1982	700.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
12-Feb-1982	798.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
Final Carbon Column Effluent				
27-Apr-1981	1002.0	BGM cell line	.003	N.D.
		RD cell line	.003	N.D.
2-Jun-1981	1000.0	BGM cell line	.010	N.D.
		MA104 cell line	.007	N.D.
7-Jul-1981	1000.0	BGM cell line	.002	N.D.
		RD cell line	.002	N.D.
14-Jul-1981	1000.0	BGM cell line	.010	N.D.
		MA104 cell line	.010	N.D.
28-Aug-1981	909.0	BGM cell line	.007	N.D.
		MA104 cell line	.006	N.D.
9-Oct-1981	1000.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
3-Nov-1981	799.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
9-Dec-1981	564.0	BGM cell line	.055	N.D.
		MA104 cell line	.055	N.D.
28-Jan-1982	700.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
11-Feb-1982	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
EEWTP Finished Water (See Table H-7 for Results)				

TABLE G-1-8
PROCESS PERFORMANCE
16 MARCH 1981 TO 16 MARCH 1982
PARASITES

EEWTP Blend Tank

Samples Assayed:	2
Total Volume Filtered (Gallons):	300.0
Total Equivalent Volume (Gallons):	275.0
Samples with Unknown Volume:	0
Samples with Unknown Equiv. Volume:	0

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

Dual Media Filter Effluent

Samples Assayed:	7
Total Volume Filtered (Gallons):	4002.0
Total Equivalent Volume (Gallons):	120.1
Samples with Unknown Volume:	2
Samples with Unknown Equiv. Volume:	3

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

Final Carbon Column Effluent

Samples Assayed:	8
Total Volume Filtered (Gallons):	4456.0
Total Equivalent Volume (Gallons):	48.6
Samples with Unknown Volume:	2
Samples with Unknown Equiv. Volume:	6

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

EEWTP Finished Water

Samples Assayed:	15
Total Volume Filtered (Gallons):	10965.0
Total Equivalent Volume (Gallons):	2132.1
Samples with Unknown Volume:	3
Samples with Unknown Equiv. Volume:	5

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

TABLE G-1-9
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
ORGANIC SURROGATE PARAMETERS -- TOC AND TOX

Constituent	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Organic Carbon: DC80 (MDL=0.06 mg/l-C)						
No. of Samples	293	57 (**)	55 (**)	58 (**)	307	294
No. Above MDL	293	57	55	58	307	294
Arithmetic Mean	4.64	3.10	2.82	2.50	1.59	1.59
Standard Deviation	1.41	0.38	0.23	0.44	0.68	0.60
Geometric Mean	4.50	3.08	2.81	2.48	1.41	1.43
Spread Factor	1.28	1.12	1.08	1.15	1.73	1.65
Median Value	4.4	3.0	2.8	2.4	1.8	1.7
90% Less Than	5.4	3.5	3.2	2.9	2.2	2.2
Total Organic Carbon: DC80 [grab samples] (MDL=0.06 mg/l-C)						
No. of Samples	868	869	865	833	852	387
No. Above MDL	868	869	865	833	852	387
Arithmetic Mean	4.66	3.30	2.95	2.22	1.62	1.90
Standard Deviation	0.75	0.58	0.41	0.60	0.64	0.61
Geometric Mean	4.60	3.26	2.92	2.11	1.46	1.79
Spread Factor	1.17	1.18	1.15	1.43	1.67	1.46
Median Value	4.5	3.2	2.9	2.3	1.7	2.0
90% Less Than	5.7	4.1	3.5	2.9	2.4	2.6
Total Organic Halogen (MDL=3.9 ug/l-Cl)						
No. of Samples	298	58 (**)	96 (**)	104 (**)	309	299
No. Above MDL	298	58	96	104	304	295
Arithmetic Mean	88.49	68.62	128.65	94.52	50.73	97.62
Standard Deviation	27.47	19.28	44.43	20.62	27.42	58.42
Geometric Mean	84.98	66.38	122.67	91.75	42.88	77.90
Spread Factor	1.32	1.28	1.34	1.31	1.93	2.17
Median Value	85.0	65.0	120.0	90.0	50.0	90.0
90% Less Than	115.0	90.0	170.0	115.0	80.0	195.0

TABLE G-1-10
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES

(Note: Analysis for compounds by Acid w/ methylation
and by CLS GCMS began on 1 December, 1981)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Chloroform: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	93	30	28	30	97	98
No. Detected	90	26	28	30	90	95
No. Above MDL	90	26	28	30	89	93
Arithmetic Mean	1.94	1.84	7.69	6.76	3.80	7.30
Standard Deviation	1.63	1.37	4.12	2.65	4.73	11.02
Geometric Mean	1.54	1.34	6.90	6.31	2.31	4.06
Spread Factor	1.95	2.54	1.57	1.44	3.14	3.27
Median Value	1.5	1.6	6.5	6.2	3.5	5.0
90% Less Than	3.1	4.2	12.0	10.0	6.7	11.0
Chloroform: LLE ECD [grab samples]						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	60 (*)	69 (*)	58 (*)	56 (*)	57 (*)	62 (*)
No. Detected	60	68	58	55	54	60
No. Above MDL	39	39	58	55	50	58
Arithmetic Mean	0.84	0.92	3.13	3.01	1.94	3.67
Standard Deviation	0.68	0.99	1.63	1.45	1.30	5.44
Geometric Mean	0.52	0.43	2.61	2.58	1.41	2.12
Spread Factor	2.93	3.87	1.98	1.88	2.56	2.85
Median Value	0.6	0.6	3.0	3.1	1.9	2.5
90% Less Than	1.7	2.4	5.0	[illegible]	3.9	5.0
Chloroform: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	19		9		20	18
No. Detected	19		9		20	18
No. Above MDL	19		9		19	18
Arithmetic Mean	1.61		6.83		3.41	7.89
Standard Deviation	0.64		4.52		2.02	4.79
Geometric Mean	1.50		5.00		2.50	6.36
Spread Factor	1.48		2.44		2.69	2.07
Median Value	1.5		7.9		3.5	7.7
90% Less Than	2.5		13.0		5.8	13.0
Maximum Value	3.5		13.0		8.1	21.0
Bromodichloromethane: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	93	30	28	30	97	99
No. Detected	90	27	28	30	83	98
No. Above MDL	44	14	28	30	68	92
Arithmetic Mean	0.32	0.25	3.07	2.47	1.04	3.60
Standard Deviation	0.21	0.10	2.18	0.78	1.04	3.50
Geometric Mean	0.27	0.28	2.34	2.35	0.64	2.17
Spread Factor	1.74	1.20	2.19	1.38	3.03	3.06
Median Value	NQ	NQ	2.4	2.4	1.0	2.5
90% Less Than	0.6	0.3	6.0	3.2	2.2	8.7
Bromodichloromethane: LLE ECD [grab samples]						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	60 (*)	69 (*)	58 (*)	56 (*)	57 (*)	62 (*)
No. Detected	59	67	58	55	52	61
No. Above MDL	24	30	58	55	45	57
Arithmetic Mean	0.30	0.54	2.64	1.95	0.88	2.39
Standard Deviation	0.18	0.89	1.49	0.93	0.74	2.64
Geometric Mean	0.25	0.22	2.26	1.70	0.64	1.49
Spread Factor	1.74	3.42	1.77	1.77	2.40	2.79
Median Value	NQ	NQ	2.3	2.1	0.6	1.7
90% Less Than	0.5	1.1	4.7	3.2	1.9	4.5

TABLE G-1-10
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Bromodichloromethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	19		9		20	18
No. Detected	17		8		17	18
No. Above MDL	12		8		16	18
Arithmetic Mean	0.20		2.06		0.91	6.57
Standard Deviation	0.10		1.31		0.84	5.65
Geometric Mean	0.20		1.45		0.61	4.60
Spread Factor	1.37		2.89		2.79	2.36
Median Value	0.2		1.9		0.8	3.5
90% Less Than	0.3		4.3		1.5	15.0
Maximum Value	0.5		4.3		3.7	21.0
Bromodichloromethane: CLS GCMS						
(IDL= 0.001 ug/l;MDL= 0.070 ug/l)						
No. of Samples	9		8		9	9
No. Detected	9		7		9	9
No. Above MDL	8		7		9	9
Arithmetic Mean	0.4039		2.7013		0.8278	2.0656
Standard Deviation	0.6082		3.1162		0.5624	1.0721
Geometric Mean	0.2278		1.3031		0.7075	1.8110
Spread Factor	2.68		4.73		1.71	1.69
Median Value	0.220		1.700		0.730	1.900
90% Less Than	2.000		9.900		2.200	3.600
Maximum Value	2.000		9.900		2.200	3.600
Dibromochloromethane: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	93	30	28	30	97	99
No. Detected	60	21	27	30	65	94
No. Above MDL	25	5	27	30	50	91
Arithmetic Mean	0.14	0.14	1.24	0.91	0.37	2.13
Standard Deviation	0.08	0.08	1.11	0.37	0.74	1.84
Geometric Mean	0.16	0.11	0.90	0.84	0.21	1.35
Spread Factor	1.39	1.78	2.27	1.49	2.86	2.99
Median Value	NQ	NQ	0.9	0.8	0.2	1.6
90% Less Than	0.2	0.2	2.8	1.3	0.7	5.3
Dibromochloromethane: LLE ECD [grab samples]						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	60 (*)	69 (*)	58 (*)	56 (*)	57 (*)	62 (*)
No. Detected	50	58	58	55	47	61
No. Above MDL	7	14	58	51	25	56
Arithmetic Mean	0.16	0.30	1.35	0.82	0.27	1.78
Standard Deviation	0.14	0.51	0.87	0.53	0.28	1.60
Geometric Mean		0.04	1.11	0.65	0.17	1.21
Spread Factor		8.13	1.90	2.08	2.60	2.66
Median Value	NQ	NQ	1.0	0.7	NQ	1.6
90% Less Than	0.2	0.8	2.5	1.4	0.6	3.0
Dibromochloromethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	19		9		20	18
No. Detected	7		8		11	17
No. Above MDL	1		3		1	16
Arithmetic Mean	0.16		0.33		0.17	3.86
Standard Deviation	0.22		0.21		0.11	3.38
Geometric Mean			0.32			2.22
Spread Factor			1.64			3.44
Median Value	ND		NQ		NQ	2.7
90% Less Than	NQ		0.8		NQ	9.9
Maximum Value	1.0		0.8		0.4	11.0

TABLE G-1-10
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Dibromochloromethane: CLS GCMS						
(IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9		8		9	9
No. Detected	9		8		9	9
No. Above MDL	8		8		8	9
Arithmetic Mean	0.1169		1.5800		0.2891	2.7556
Standard Deviation	0.0648		1.3848		0.3020	2.6773
Geometric Mean	0.1061		1.1447		0.1824	2.1327
Spread Factor	1.62		2.19		2.78	1.88
Median Value	0.100		0.720		0.201	1.700
90% Less Than	0.260		3.800		1.000	9.500
Maximum Value	0.260		3.800		1.000	9.500
Bromoform: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	93	30	28	30	97	99
No. Detected	11	4	10	5	13	57
No. Above MDL	5	1	8	2	2	50
Arithmetic Mean	0.07	0.07	0.27	0.07	0.07	0.42
Standard Deviation	0.07	0.05	0.76	0.06	0.10	0.52
Geometric Mean			0.08			0.22
Spread Factor			4.11			3.49
Median Value	ND	ND	ND	ND	ND	0.2
90% Less Than	NQ	NQ	0.4	NQ	NQ	1.1
Bromoform: LLE ECD [grab samples]						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	60 (*)	69 (*)	58 (*)	56 (*)	57 (*)	62 (*)
No. Detected	11	15	43	39	11	49
No. Above MDL	1	1	15	1	0	37
Arithmetic Mean	0.07	0.07	0.17	0.12	NQ	0.42
Standard Deviation	0.07	0.05	0.13	0.05		0.41
Geometric Mean			0.13			0.27
Spread Factor			1.96			2.78
Median Value	ND	ND	NQ	NQ	ND	0.3
90% Less Than	NQ	NQ	0.3	NQ	NQ	0.9
Bromoform: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	19		9		20	18
No. Detected	1		0		2	12
No. Above MDL	0		0		0	9
Arithmetic Mean	NQ		ND		NQ	0.59
Standard Deviation						0.57
Geometric Mean						0.58
Spread Factor						1.85
Median Value	ND		ND		ND	NQ
90% Less Than	ND		ND		ND	1.8
Maximum Value	NQ		ND		NQ	1.9
Bromoform: CLS GCMS						
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)						
No. of Samples	9		8		9	9
No. Detected	4		8		3	9
No. Above MDL	0		5		1	9
Arithmetic Mean	NQ		0.2208		0.0120	0.6582
Standard Deviation			0.3177		0.0160	0.753[illegible]
Geometric Mean			0.0696			0.3399
Spread Factor			5.52			3.43
Median Value	ND		0.041		ND	0.350
90% Less Than	NQ		0.930		0.048	2.200
Maximum Value	NQ		0.930		0.048	2.200

TABLE G-1-10
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Dichloroiodomethane: LLE ECD (IDL= 0.5 ug/l; MDL= 0.5 ug/l)						
No. of Samples	85	21	21	21	87	92
No. Detected	3	0	1	0	6	3
No. Above MDL	0	0	1	0	0	1
Arithmetic Mean	NQ	ND	0.41	ND	NQ	0.27
Standard Deviation			0.73			0.11
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Dichloroiodomethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL=NA ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Total Trihalomethanes: LLE ECD (IDL= 0.1 ug/l; MDL= 0.2 ug/l)						
No. of Samples	93	30	28	30	97	94
No. Detected	92	28	28	30	91	94
No. Above MDL	92	28	28	30	89	92
Arithmetic Mean	2.35	2.17	12.24	10.17	5.62	13.14
Standard Deviation	1.74	1.45	6.38	3.41	7.27	14.77
Geometric Mean	1.92	1.60	10.78	9.66	2.93	7.72
Spread Factor	1.88	2.52	1.67	1.37	3.93	3.37
Median Value	1.8	1.9	10.6	9.4	4.7	9.5
90% Less Than	4.4	4.5	25.8	14.7	10.0	25.1
Total Trihalomethanes: LLE ECD [grab samples] (IDL= 0.1 ug/l; MDL= 0.2 ug/l)						
No. of Samples	60 (*)	70 (*)	59 (*)	57 (*)	58 (*)	59 (*)
No. Detected	60	70	59	56	56	59
No. Above MDL	51	61	59	56	54	57
Arithmetic Mean	1.13	1.58	7.14	5.75	2.98	6.06
Standard Deviation	0.93	2.26	3.48	2.62	2.26	4.03
Geometric Mean	0.73	0.74	6.28	4.96	1.99	4.31
Spread Factor	2.84	3.47	1.70	1.92	2.89	2.72
Median Value	0.9	0.7	6.5	6.0	2.4	5.7
90% Less Than	2.5	4.8	11.8	9.6	6.2	11.7
Bromochloromethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.6 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		NQ	ND

TABLE G-1-10
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Bromomethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		NQ	ND
Carbon Tetrachloride: LLE ECD (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	93	30	28	30	97	99
No. Detected	40	8	14	16	33	49
No. Above MDL	4	2	4	3	1	6
Arithmetic Mean	0.10	0.08	0.18	0.11	0.09	0.11
Standard Deviation	0.06	0.06	0.40	0.06	0.05	0.07
Median Value	ND	ND	ND	NQ	ND	ND
90% Less Than	NQ	NQ	0.2	NQ	NQ	NQ
Carbon Tetrachloride: LLE ECD [grab samples] (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	60 (*)	69 (*)	58 (*)	56 (*)	57 (*)	62 (*)
No. Detected	44	46	47	48	45	48
No. Above MDL	5	3	6	5	6	9
Arithmetic Mean	0.13	0.12	0.14	0.15	0.14	0.27
Standard Deviation	0.05	0.05	0.06	0.06	0.05	1.00
Median Value	NQ	NQ	NQ	NQ	NQ	NQ
90% Less Than	NQ	NQ	NQ	NQ	0.2	0.2
Carbon Tetrachloride: purge & trap GCMS (IDL= 0.3 ug/l;MDL= 0.5 ug/l)						
No. of Samples	19		9		20	18
No. Detected	1		1		0	2
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		ND	NQ
Median Value	ND		ND		ND	ND
90% Less Than	ND		NQ		ND	NQ
Maximum Value	NQ		NQ		ND	NQ
Chloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	1
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	NQ
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	NQ

TABLE G-1-10
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Dichlorodifluoromethane: purge & trap GCMS (IDL= 0.1 ug/l:MDL=NA ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Dichloromethane (Methylene chloride): purge & trap GCMS (IDL= 0.1 ug/l:MDL= 2.0 ug/l)						
No. of Samples	19		9		20	18
No. Detected	1		0		1	1
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		ND		NQ	NQ
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	NQ		ND		NQ	NQ
Iodoform: purge & trap GCMS (IDL= 0.1 ug/l:MDL=NA ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Trichlorofluoromethane: purge & trap GCMS (IDL= 0.1 ug/l:MDL= 0.4 ug/l)						
No. of Samples	19		9		20	18
No. Detected	8		1		7	8
No. Above MDL	4		0		6	6
Arithmetic Mean	0.85		NQ		0.78	0.37
Standard Deviation	1.75				2.19	0.49
Geometric Mean	0.04				0.14	0.26
Spread Factor	20.42				6.56	2.89
Median Value	ND		ND		ND	ND
90% Less Than	5.1		NQ		0.9	1.3
Maximum Value	5.8		NQ		9.7	1.6

TABLE G-1-10
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Chloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	0
No. Above MDL	0		0		1	0
Arithmetic Mean	ND		ND		0.06	ND
Standard Deviation					0.03	
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		0.2	ND
1,2-Dibromoethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		NQ	ND
1,2-Dibromoethane: CLS GCMS						
(IDL= 0.002 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9		8		9	9
No. Detected	1		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	NQ		ND		ND	ND
Maximum Value	NQ		ND		ND	ND
1,1-Dichloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		NQ	ND
1,2-Dichloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-1-10
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Hexachloroethane: CLS GCMS						
(IDL= 0.010 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9		8		9	9
No. Detected	0		1		0	0
No. Above MDL	0		1		0	0
Arithmetic Mean	ND		0.0331		ND	ND
Standard Deviation			0.0795			
Median Value	ND		ND		ND	ND
90% Less Than	ND		0.230		ND	ND
Maximum Value	ND		0.230		ND	ND
Hexachloroethane: Base neut. LLE GCMS						
(IDL= 0.5 ug/l;MDL= 7.5 ug/l)						
No. of Samples	16		5		16	15
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1,2,2-Tetrachloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		NQ	ND
1,1,2,2-Tetrachloroethane: CLS GCMS						
(IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9		8		9	9
No. Detected	1		1		1	1
No. Above MDL	1		1		1	0
Arithmetic Mean	0.0083		0.0204		0.0949	NQ
Standard Deviation	0.0235		0.0564		0.2832	
Median Value	ND		ND		ND	ND
90% Less Than	0.071		0.160		0.850	NQ
Maximum Value	0.071		0.160		0.850	NQ
1,1,1-Trichloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	19		9		20	18
No. Detected	15		5		10	10
No. Above MDL	6		0		1	0
Arithmetic Mean	0.17		NQ		0.10	NQ
Standard Deviation	0.12				0.05	
Geometric Mean	0.15					
Spread Factor	1.74					
Median Value	NQ		NQ		ND	NQ
90% Less Than	0.3		NQ		NQ	NQ
Maximum Value	0.6		NQ		0.2	NQ

TABLE G-1-10
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
1,1,2-Trichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	0
No. Above MDL	0		0		1	0
Arithmetic Mean	ND		ND		0.05	ND
Standard Deviation					0.01	
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		0.1	ND
1,1,2-Trichloroethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.070 ug/l)						
No. of Samples	9		8		9	9
No. Detected	4		3		2	1
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		NQ	NQ
Median Value	ND		ND		ND	ND
90% Less Than	NQ		NQ		NQ	NQ
Maximum Value	NQ		NQ		NQ	NQ
1,2-Dibromo-3-chloropropane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dichloropropane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	19		9		20	18
No. Detected	1		0		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	NQ		ND		NQ	ND
1,2-Dichloropropane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.080 ug/l)						
No. of Samples	9		8		9	9
No. Detected	8		6		4	3
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		NQ	NQ
Median Value	NQ		NQ		ND	ND
90% Less Than	NQ		NQ		NQ	NQ
Maximum Value	NQ		NQ		NQ	NQ

TABLE G-1-11
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Chloroethene (Vinyl chloride): purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		NQ	ND
1,1-Dichloroethene: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		NQ	ND
cis-1,2-Dichloroethene: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
trans-1,2-Dichloroethene: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	1
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		NQ	NQ
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		NQ	NQ
Tetrachloroethene: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	93	30	28	30	97	99
No. Detected	91	29	28	24	44	50
No. Above MDL	72	27	23	16	4	1
Arithmetic Mean	1.24	1.30	1.29	0.51	0.17	0.15
Standard Deviation	1.32	1.21	1.21	0.40	0.19	0.10
Geometric Mean	0.78	0.99	0.92	0.44		
Spread Factor	2.67	2.08	2.33	2.00		
Median Value	0.7	1.1	1.0	0.4	ND	NQ
90% Less Than	2.7	2.1	2.3	0.9	NQ	NQ

TABLE G-1-11
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Tetrachloroethene: LLE ECD [grab samples] (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	60 (*)	69 (*)	58 (*)	56 (*)	57 (*)	62 (*)
No. Detected	60	67	58	42	25	33
No. Above MDL	47	41	31	2	0	0
Arithmetic Mean	1.15	0.76	0.58	0.21	NQ	NQ
Standard Deviation	1.02	0.59	0.47	0.09		
Geometric Mean	0.77	0.54	0.43			
Spread Factor	2.53	2.44	2.20			
Median Value	0.7	0.6	0.4	NQ	ND	NQ
90% Less Than	3.0	1.6	1.1	NQ	NQ	NQ
Tetrachloroethene: purge & trap GCMS (IDL= 0.2 ug/l;MDL= 0.5 ug/l)						
No. of Samples	19		9		20	18
No. Detected	15		9		8	6
No. Above MDL	12		5		0	0
Arithmetic Mean	1.02		0.69		NQ	NQ
Standard Deviation	0.92		0.44			
Geometric Mean	0.74		0.55			
Spread Factor	2.48		1.93			
Median Value	0.7		0.5		ND	ND
90% Less Than	2.2		1.5		NQ	NQ
Maximum Value	3.6		1.5		NQ	NQ
Tetrachloroethene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.020 ug/l)						
No. of Samples	9		8		9	9
No. Detected	9		7		3	3
No. Above MDL	9		7		3	3
Arithmetic Mean	2.7689		1.0139		0.0456	0.0589
Standard Deviation	2.4018		0.7873		0.0621	0.0897
Geometric Mean	1.9204		0.4778		0.0094	0.0084
Spread Factor	2.45		5.90		8.87	11.78
Median Value	1.700		0.880		ND	ND
90% Less Than	7.000		2.400		0.150	0.230
Maximum Value	7.000		2.400		0.150	0.230
Trichloroethene: LLE ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	93	30	28	30	97	99
No. Detected	32	18	15	10	14	12
No. Above MDL	9	9	6	1	1	1
Arithmetic Mean	0.13	0.24	0.23	0.10	0.07	0.08
Standard Deviation	0.16	0.23	0.28	0.08	0.06	0.13
Geometric Mean		0.21	0.12			
Spread Factor		2.10	3.12			
Median Value	ND	NQ	NQ	ND	ND	ND
90% Less Than	NQ	0.5	0.6	NQ	NQ	NQ
Trichloroethene: LLE ECD [grab samples] (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	60 (*)	69 (*)	58 (*)	56 (*)	57 (*)	62 (*)
No. Detected	32	32	21	14	15	22
No. Above MDL	4	4	4	3	4	10
Arithmetic Mean	0.19	0.16	0.16	0.12	0.13	0.16
Standard Deviation	0.28	0.24	0.27	0.23	0.21	0.21
Geometric Mean						0.11
Spread Factor						2.68
Median Value	NQ	ND	ND	ND	ND	ND
90% Less Than	NQ	NQ	NQ	NQ	NQ	0.4

TABLE G-1-11
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Trichloroethene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.7 ug/l)						
No. of Samples	19		9		20	18
No. Detected	7		3		4	3
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		NQ	NQ
Median Value	ND		ND		ND	ND
90% Less Than	NQ		NQ		NQ	NQ
Maximum Value	NQ		NQ		NQ	NQ
Trichloroethene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.130 ug/l)						
No. of Samples	9		8		9	9
No. Detected	7		4		0	0
No. Above MDL	7		4		0	0
Arithmetic Mean	0.2122		0.0715		ND	ND
Standard Deviation	0.2196		0.0784			
Geometric Mean	0.1483		0.1204			
Spread Factor	2.60		1.26			
Median Value	0.140		ND		ND	ND
90% Less Than	0.630		0.180		ND	ND
Maximum Value	0.630		0.180		ND	ND
cis-1,2-Dichloropropene: Purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
cis-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
trans-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		NQ	ND

TABLE G-1-11
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent (**)	Dual Media Filter Effluent (**)	Lead Carbon Column Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Hexachlorobutadiene: purge & trap GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)						
No. of Samples	19		9		20	18
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachlorobutadiene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9		8		9	9
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachlorobutadiene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=12.0 ug/l)						
No. of Samples	16		5		16	15
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981; Analysis for compounds by Acid without methylation was terminated on 31 November, 1981)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Benzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	2	2
No. Above MDL	0	0	2	2
Arithmetic Mean	ND	ND	0.09	0.09
Standard Deviation			0.13	0.15
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	0.1
Maximum Value	ND	ND	0.6	0.7
Ethenylbenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL=NA ug/l)				
No. of Samples	19	9	20	18
No. Detected	1	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	ND
Ethenylbenzene: CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.020 ug/l)				
No. of Samples	9	8	9	9
No. Detected	7	8	7	6
No. Above MDL	5	6	6	3
Arithmetic Mean	0.0380	0.0361	0.0206	0.0212
Standard Deviation	0.0450	0.0272	0.0159	0.0220
Geometric Mean	0.0224	0.0302	0.0215	0.0137
Spread Factor	2.99	1.85	1.52	2.88
Median Value	0.020	0.028	0.021	NQ
90% Less Than	0.120	0.097	0.056	0.063
Maximum Value	0.120	0.097	0.056	0.063
Ethylbenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	1	5
No. Above MDL	0	0	1	0
Arithmetic Mean	ND	ND	0.06	NQ
Standard Deviation			0.03	
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	0.2	NQ
Ethylbenzene: CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)				
No. of Samples	9	8	9	9
No. Detected	7	6	6	7
No. Above MDL	4	5	2	3
Arithmetic Mean	0.0651	0.0931	0.0307	0.0356
Standard Deviation	0.0789	0.0944	0.0361	0.0389
Geometric Mean	0.0350	0.0612	0.0175	0.0276
Spread Factor	3.38	2.90	3.13	2.27
Median Value	NQ	0.054	NQ	NQ
90% Less Than	0.200	0.250	0.110	0.130
Maximum Value	0.200	0.250	0.110	0.130

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Propylbenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	[illegible]	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	NQ	ND
Propylbenzene: CLS GCMS				
(IDL= 0.001 ug/l;MDL= 0.010 ug/l)				
No. of Samples	9	8	9	9
No. Detected	8	8	3	4
No. Above MDL	6	6	0	2
Arithmetic Mean	0.0199	0.0351	NQ	0.0085
Standard Deviation	0.0206	0.0406		0.0167
Geometric Mean	0.0145	0.0217		0.0030
Spread Factor	2.35	2.77		4.72
Median Value	0.015	0.021	ND	ND
90% Less Than	0.067	0.130	NQ	0.052
Maximum Value	0.067	0.130	NQ	0.052
Toluene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	19	9	20	18
No. Detected	3	0	4	3
No. Above MDL	3	0	4	3
Arithmetic Mean	0.12	ND	0.21	0.13
Standard Deviation	0.19		0.39	0.20
Geometric Mean	0.01		0.01	0.01
Spread Factor	11.97		19.21	13.08
Median Value	ND	ND	ND	ND
90% Less Than	0.4	ND	0.7	0.6
Maximum Value	0.8	ND	1.6	0.7
Toluene: CLS GCMS				
(IDL= 0.020 ug/l;MDL= 0.090 ug/l)				
No. of Samples	9	8	9	9
No. Detected	6	7	2	4
No. Above MDL	6	7	2	4
Arithmetic Mean	0.1578	0.2544	0.0314	0.0813
Standard Deviation	0.1911	0.2719	0.0431	0.0960
Geometric Mean	0.1179	0.1930	0.0730	0.0828
Spread Factor	2.36	2.08	1.32	2.05
Median Value	0.110	0.180	ND	ND
90% Less Than	0.600	0.900	0.120	0.270
Maximum Value	0.600	0.900	0.120	0.270
1,2-Xylene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	1	6
No. Above MDL	0	0	1	5
Arithmetic Mean	ND	ND	0.06	0.07
Standard Deviation			0.03	0.02
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	0.1
Maximum Value	ND	ND	0.2	0.1

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
1,2-Xylene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.030 ug/l)				
No. of Samples	9	8	9	9
No. Detected	7	8	3	5
No. Above MDL	5	8	2	4
Arithmetic Mean	0.0729	0.1384	0.0156	0.0355
Standard Deviation	0.0906	0.1589	0.0249	0.0413
Geometric Mean	0.0383	0.0941	0.0153	0.0283
Spread Factor	3.49	2.27	2.40	2.52
Median Value	0.045	0.095	ND	NQ
90% Less Than	0.270	0.520	0.076	0.120
Maximum Value	0.270	0.520	0.076	0.120
1,3-Xylene/1,4-Xylene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)				
No. of Samples	19	9	20	18
No. Detected	2	0	2	6
No. Above MDL	0	0	1	0
Arithmetic Mean	NQ	ND	0.08	NQ
Standard Deviation			0.09	
Median Value	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	NQ
Maximum Value	NQ	ND	0.4	NQ
1,3-Xylene/1,4-Xylene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.040 ug/l)				
No. of Samples	9	8	9	9
No. Detected	7	6	3	5
No. Above MDL	6	5	1	4
Arithmetic Mean	0.0712	0.0974	0.0114	0.0505
Standard Deviation	0.0927	0.1013	0.0147	0.0638
Geometric Mean	0.0497	0.0638		0.0370
Spread Factor	2.40	2.90		2.74
Median Value	0.047	0.068	ND	NQ
90% Less Than	0.300	0.260	0.043	0.190
Maximum Value	0.300	0.260	0.043	0.190
Nitrobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 2.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Methyl-2,4-dinitrobenzene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
1-Methyl-2,6-Dinitrobenzene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzylbutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	14	3	14	13
No. Detected	1	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	NQ	ND	NQ	ND
Di-n-Butylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 9.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	1	2	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
Dicyclohexylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Diethylphthalate: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 9.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	1	0	1	1
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	NQ	NQ
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	NQ	ND	NQ	NQ
Diisobutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dimethylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL=10.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dioctylphthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Diphenylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Phenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
Phenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	1	1	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
2,4-Dimethylphenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
2,4-Dimethylphenol: Acid LLE (w/ methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dinitrophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
2,4-Dinitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Methyl-4,6-dinitrophenol: Acid LLE (w/o methyl.) GCMS (IDL=10.0 ug/l;MDL=NA ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
2-Methyl-4,6-dinitrophenol: Acid LLE (w/ methyl.) GCMS (IDL=10.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Nitrophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
2-Nitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
4-Nitrophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
4-Nitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthene: CLS GCMS (IDL= 0.010 ug/l;MDL=NA ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 3.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthylene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)				
No. of Samples	14	3	14	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Napthalene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	NQ	ND
Napthalene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.040 ug/l)				
No. of Samples	9	8	9	9
No. Detected	5	5	2	2
No. Above MDL	1	4	1	2
Arithmetic Mean	0.0222	0.0671	0.0198	0.0311
Standard Deviation	0.0239	0.0790	0.0374	0.0548
Geometric Mean		0.0419		0.0129
Spread Factor		3.06		4.81
Median Value	NQ	NQ	ND	ND
90% Less Than	0.080	0.200	0.118	0.158
Maximum Value	0.080	0.200	0.118	0.158
Napthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Anthracene: CLS GCMS (IDL= 0.050 ug/l;MDL= 0.090 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Anthracene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 6.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Benzidine: Base neut. LLE GCMS (IDL=50.0 ug/l:MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(a)anthracene: Base neut. LLE GCMS (IDL= 1.0 ug/l:MDL= 7.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(b)fluoranthene: Base neut. LLE GCMS (IDL= 1.0 ug/l:MDL=10.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(k)fluoranthene: Base neut. LLE GCMS (IDL= 1.0 ug/l:MDL=10.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(g,h,i)perylene: Base neut. LLE GCMS (IDL= 1.0 ug/l:MDL=20.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Benzo(a)pyrene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Chrysene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 6.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dibenzo(a,h)anthracene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 9.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
3,3'-Dichlorobenzidine: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Diphenylhydrazine/Azobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 7.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
1,2-Diphenylhydrazine/Azobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.100 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Fluoranthene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples	14	3	14	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Fluorene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 3.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Fluorene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.080 ug/l)				
No. of Samples	9	8	9	9
No. Detected	1	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND
Maximum Value	NQ	ND	ND	ND
Indeno(1,2,3-cd)pyrene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=30.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-12
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Phenanthrene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Phenanthrene: CLS GCMS (IDL= 0.050 ug/l;MDL= 0.120 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Pyrene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples	14	3	14	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981; Analysis for compounds by Acid without methylation was terminated on 31 November, 1981)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Bromobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Bromobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Bromobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	9	8	9	9
No. Detected	1	1	2	2
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	NQ	NQ
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	NQ	NQ
Maximum Value	NQ	NQ	NQ	NQ
Chlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	19	9	20	18
No. Detected	1	0	1	1
No. Above MDL	1	0	1	0
Arithmetic Mean	0.13	ND	0.06	NQ
Standard Deviation	0.33		0.03	
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	1.5	ND	0.2	NQ
Chlorobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.020 ug/l)				
No. of Samples	9	8	9	9
No. Detected	1	1	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	NQ	ND
Maximum Value	NQ	NQ	NQ	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
4-Chloro-1-methylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chloro-1-methylbenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	9	8	9	9
No. Detected	3	1	0	0
No. Above MDL	1	1	0	0
Arithmetic Mean	0.0130	0.0118	ND	ND
Standard Deviation	0.0303	0.0320		
Median Value	ND	ND	ND	ND
90% Less Than	0.093	0.091	ND	ND
Maximum Value	0.093	0.091	ND	ND
1,2-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	19	9	20	18
No. Detected	8	1	1	0
No. Above MDL	3	0	1	0
Arithmetic Mean	0.13	ND	0.06	ND
Standard Deviation	0.13		0.03	
Geometric Mean	0.08			
Spread Factor	2.65			
Median Value	ND	ND	ND	ND
90% Less Than	0.3	ND	ND	ND
Maximum Value	0.6	ND	0.2	ND
1,2-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	1	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	9	8	9	9
No. Detected	9	8	0	0
No. Above MDL	8	7	0	0
Arithmetic Mean	0.0570	0.0401	ND	ND
Standard Deviation	0.0373	0.0343		
Geometric Mean	0.0486	0.0328		
Spread Factor	1.82	1.85		
Median Value	0.048	0.029	ND	ND
90% Less Than	0.140	0.120	ND	ND
Maximum Value	0.140	0.120	ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
1,3-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	19	9	20	18
No. Detected	8	1	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	ND
Maximum Value	NQ	NQ	NQ	ND
1,3-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	1	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	ND
1,3-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	9	8	9	9
No. Detected	9	8	3	4
No. Above MDL	9	7	0	0
Arithmetic Mean	0.1176	0.1063	NQ	NQ
Standard Deviation	0.1271	0.1148		
Geometric Mean	0.0752	0.0709		
Spread Factor	2.48	2.50		
Median Value	0.065	0.064	ND	ND
90% Less Than	0.370	0.370	NQ	NQ
Maximum Value	0.370	0.370	NQ	NQ
1,4-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	19	9	20	18
No. Detected	7	1	1	0
No. Above MDL	2	0	1	0
Arithmetic Mean	0.11	NQ	0.06	ND
Standard Deviation	0.13		0.03	
Median Value	ND	ND	ND	ND
90% Less Than	0.2	NQ	ND	ND
Maximum Value	0.6	NQ	0.2	ND
1,4-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 6.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	1	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
1,4-Dichlorobenzene: CLS GCMS				
(IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	9	8	9	9
No. Detected	8	8	5	4
No. Above MDL	8	8	0	0
Arithmetic Mean	0.1757	0.1801	NQ	NQ
Standard Deviation	0.2130	0.2233		
Geometric Mean	0.1057	0.1113		
Spread Factor	2.89	2.51		
Median Value	0.090	0.056	NQ	ND
90% Less Than	0.710	0.710	NQ	NQ
Maximum Value	0.710	0.710	NQ	NQ
Hexachlorobenzene: Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 2.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Hexachlorobenzene: CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.050 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloro-2-nitrobenzene: Base neut. LLE GCMS				
(IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloro-3-nitrobenzene: Base neut. LLE GCMS				
(IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloro-4-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2,3-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	NQ	ND
1,2,3-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)				
No. of Samples	9	8	9	9
No. Detected	6	6	3	2
No. Above MDL	1	0	0	0
Arithmetic Mean	0.0156	NQ	NQ	NQ
Standard Deviation	0.0185			
Median Value	NQ	NQ	ND	ND
90% Less Than	0.061	NQ	NQ	NQ
Maximum Value	0.061	NQ	NQ	NQ
1,2,4-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	NQ	ND
1,2,4-Trichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 8.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
1,2,4-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l; MDL= 0.020 ug/l)				
No. of Samples	9	8	9	9
No. Detected	7	7	3	4
No. Above MDL	4	3	0	0
Arithmetic Mean	0.0162	0.0166	NQ	NQ
Standard Deviation	0.0122	0.0123		
Geometric Mean	0.0199	0.0176		
Spread Factor	1.42	1.63		
Median Value	NQ	NQ	ND	ND
90% Less Than	0.031	0.038	NQ	NQ
Maximum Value	0.031	0.038	NQ	NQ
1,3,5-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.5 ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	NQ	ND
1,3,5-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l; MDL= 0.020 ug/l)				
No. of Samples	9	8	9	9
No. Detected	2	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND
Maximum Value	NQ	ND	ND	ND
2-Chlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l; MDL= 5.0 ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
2-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l; MDL= 8.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
2-Chloro-3-methylphenol: Acid LLE (w/o methyl.) GCMS				
(IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
2-Chloro-3-methylphenol: Acid LLE Methyl GCMS				
(IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
3-Chlorophenol: Acid LLE (w/o methyl.) GCMS				
(IDL= 0.5 ug/l;MDL= 4.0 ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
3-Chlorophenol: Acid LLE (w/ methyl.) GCMS				
(IDL= 1.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chlorophenol: Acid LLE (w/o methyl.) GCMS				
(IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
4-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 9.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chloro-3-methylphenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
4-Chloro-3-methylphenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 6.0 ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
2,4-Dichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Pentachlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=30.0 ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
Pentachlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 4.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,3,5-Trichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 8.0 ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
2,3,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,3,6-Trichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 7.0 ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
2,3,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 8.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4,5-Trichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l:MDL= 6.0 ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
2,4,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 8.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4,6-Trichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l:MDL= 7.0 ug/l)				
No. of Samples	11		11	11
No. Detected	0		0	0
No. Above MDL	0		0	0
Arithmetic Mean	ND		ND	ND
Median Value	ND		ND	ND
90% Less Than	ND		ND	ND
Maximum Value	ND		ND	ND
2,4,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 7.0 ug/l)				
No. of Samples	4	4	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l;MDL=NA ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloronaphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloronaphthalene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	NQ	ND
Maximum Value	ND	ND	NQ	ND
2-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l;MDL=NA ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloronaphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 9.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
2-Chloronaphthalene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1016: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1221: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1232: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1242: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-13
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Arochlor 1248: LLE ECD (IDL= 0.2 ug/l:MDL= 0.4 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1254: LLE ECD (IDL= 0.1 ug/l:MDL= 0.4 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1260: LLE ECD (IDL= 0.1 ug/l:MDL= 0.4 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-14
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES

(Note: Analysis for compounds by Acid w/ methylation
and by CLS GCMS began on 1 December, 1981)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Aldrin: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0.	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Atrazine: Base neut. LLE GCMS				
(IDL= 5.0 ug/l;MDL= 9.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Alpha-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.20 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Beta-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.20 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Delta-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-14
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Gamma-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.02 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Chlordane: LLE ECD				
(IDL= 0.01 ug/l;MDL=NA ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4,4'-DDD: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4,4'-DDE: LLE ECD				
(IDL= 0.01 ug/l;MDL= 1.00 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4,4'-DDT: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.09 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-14
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Dieldrin: LLE ECD (IDL= 0.01 ug/l:MDL= 0.10 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endrin: LLE ECD (IDL= 0.01 ug/l:MDL= 0.07 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endosulfan I: LLE ECD (IDL= 0.01 ug/l:MDL= 0.03 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endosulfan II: LLE ECD (IDL= 0.01 ug/l:MDL= 0.03 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endosulfan sulfate: LLE ECD (IDL= 0.01 ug/l:MDL= 0.02 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-14
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Heptachlor: LLE ECD (IDL= 0.01 ug/l;MDL= 0.20 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Heptachlor epoxide: LLE ECD (IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Hexachlorocyclopentadiene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=20.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Hexachlorocyclopentadiene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.340 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Kepone: LLE ECD (IDL= 0.01 ug/l;MDL= 2.00 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-14
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
Methoxychlor: LLE ECD (IDL= 0.01 ug/l;MDL= 0.09 ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Toxaphene: LLE ECD (IDL= 0.01 ug/l;MDL=NA ug/l)				
No. of Samples	15	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,3,7,8-Tetrachlorodibenzo-p-dioxin: Base neut. LLE GCMS (IDL=10.0 ug/l;MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Tricresolphosphate: Base neut. LLE GCMS (IDL=50.0 ug/l;MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-D: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	15	5	15	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-14
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
2,4,5-T: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)				
No. of Samples	15	5	15	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4,5-TP: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	15	5	15	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-15
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
N-Nitrosodimethylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL=10.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
N-Nitrosodiphenylamine: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 5.0 ug/l)				
No. of Samples	14	3	14	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
N-Nitrosodipropylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples	14	3	14	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Bromo-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Bromo-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-15
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloro-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 8.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloro-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l; MDL= 0.030 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	1	0	0
No. Above MDL	0	1	0	0
Arithmetic Mean	ND	0.1254	ND	ND
Standard Deviation		0.3534		
Median Value	ND	ND	ND	ND
90% Less Than	ND	1.000	ND	ND
Maximum Value	ND	1.000	ND	ND
2-Chloroethylvinylether: purge & trap GCMS (IDL= 0.1 ug/l; MDL=NA ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloroethylvinylether: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL=NA ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,1'-(Methylenebis(oxy))-bis-2-chloroethane: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 3.0 ug/l)				
No. of Samples	14	3	14	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-1-15
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent (##)	Final Carbon Column Effluent	EEWTP Finished Water
1,1'-Oxybis(2-chloroethane): Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 4.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,1'-Oxybis(2-chloroethane): CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.080 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,2'-Oxybis(2-chloropropane): Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Tetrahydrofuran: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	19	9	20	18
No. Detected	4	0	4	3
No. Above MDL	3	0	4	3
Arithmetic Mean	0.20	ND	0.28	0.20
Standard Deviation	0.36		0.54	0.44
Geometric Mean	0.02		0.03	0.02
Spread Factor	11.88		12.68	9.73
Median Value	ND	ND	ND	ND
90% Less Than	1.1	ND	1.0	0.8
Maximum Value	1.2	ND	2.1	1.8
Acetone: purge & trap GCMS				
(IDL= 0.5 ug/l;MDL= 0.5 ug/l)				
No. of Samples	19	9	18	18
No. Detected	0	2	1	2
No. Above MDL	0	2	1	2
Arithmetic Mean	ND	0.62	0.34	1.42
Standard Deviation		0.88	0.36	3.44
Geometric Mean		0.13		
Spread Factor		6.12		
Median Value	ND	ND	ND	ND
90% Less Than	ND	2.9	ND	9.6
Maximum Value	ND	2.9	1.8	12.0

TABLE G-1-15
PROCESS PERFORMANCE -- 16 MARCH 1981 TO 16 MARCH 1982 (PHASE IA)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent (**)	Final Carbon Column Effluent	EEWTP Finished Water
2-Butanone: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 1.0 ug/l)				
No. of Samples	19	9	20	18
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Isophorone: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples	16	5	16	15
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Geosmin: CLS GCMS (IDL= 0.0005 ug/l;MDL= 0.0500 ug/l)				
No. of Samples	9	8	9	9
No. Detected	5	7	1	2
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	NQ	NQ
Median Value	NQ	NQ	ND	ND
90% Less Than	NQ	NQ	NQ	NQ
Maximum Value	NQ	NQ	NQ	NQ
Methylisoborneol: CLS GCMS (IDL= 0.0005 ug/l;MDL= 0.0400 ug/l)				
No. of Samples	9	8	9	9
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

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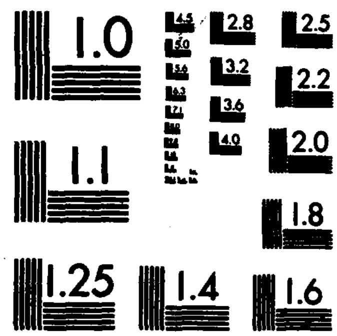

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TABLE G - 1 - 16
PROCESS PERFORMANCE: 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
VOLATILE ORGANIC ANALYSIS (PURGE AND TRAP, GC/MS)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
SYNTHETIC ORGANIC CHEMICALS — HALOGENATED ALKANES				
Halogenated Methanes (Other than THMs)				
Cyanogen chloride				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	5 / 18
Range of Concentrations	ND	ND	ND	NQ
Halogenated Ethanes				
1,2-Dichloro-1,1,2,2-tetrafluoroethane				
No. of Times Detected / No. of Samples	0 / 19	1 / 8	0 / 20	0 / 18
Range of Concentrations	ND	5.1	ND	ND
SYNTHETIC ORGANIC CHEMICALS — AROMATIC HYDROCARBONS (Non-halogenated)				
Alkylbenzenes				
1-Ethyl-2-methylbenzene				
No. of Times Detected / No. of Samples	0 / 10	1 / 8	0 / 19	0 / 18
Range of Concentrations	ND	1.2	ND	ND
1-Ethyl-3-methylbenzene				
No. of Times Detected / No. of Samples	0 / 19	1 / 8	0 / 20	0 / 18
Range of Concentrations	ND	0.3	ND	ND
1-Ethyl-4-methylbenzene				
No. of Times Detected / No. of Samples	0 / 19	1 / 8	0 / 20	0 / 18
Range of Concentrations	ND	0.5	ND	ND
Methylethylbenzenes (& Methylethylbenzene isomers)				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	1 / 20	0 / 18
Range of Concentrations	ND	ND	0.2	ND
MISCELLANEOUS ORGANIC CHEMICALS				
Aldehydes				
Butanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	2 / 18
Range of Concentrations	ND	ND	ND	NQ
Decanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	1 / 18
Range of Concentrations	ND	ND	ND	NQ
Heptanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	1 / 18
Range of Concentrations	ND	ND	ND	NQ
Hexanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	1 / 18
Range of Concentrations	ND	ND	ND	NQ
2-Methylbutanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	3 / 18
Range of Concentrations	ND	ND	ND	NQ
2-Methylpentanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	1 / 18
Range of Concentrations	ND	ND	ND	NQ
2-Methylpropanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	2 / 18
Range of Concentrations	ND	ND	ND	NQ
Nonanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	3 / 18
Range of Concentrations	ND	ND	ND	NQ
Pentanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	5 / 18
Range of Concentrations	ND	ND	ND	NQ
Alkanes				
Butane				
No. of Times Detected / No. of Samples	1 / 19	0 / 8	1 / 20	1 / 18
Range of Concentrations	NQ	ND	NQ	NQ
Hexane				
No. of Times Detected / No. of Samples	1 / 19	0 / 8	1 / 20	1 / 18
Range of Concentrations	NQ	ND	NQ	NQ
2-Methylbutane				
No. of Times Detected / No. of Samples	4 / 19	1 / 8	1 / 20	0 / 18
Range of Concentrations	NQ - 0.5	0.2	NQ	ND
Pentane				
No. of Times Detected / No. of Samples	1 / 19	0 / 8	0 / 20	0 / 18
Range of Concentrations	0.6	ND	ND	ND
Alkenes				
1-Butene				
No. of Times Detected / No. of Samples	4 / 19	1 / 8	3 / 20	3 / 18
Range of Concentrations	NQ - 0.3	0.6	NQ	NQ
Cyclic Alkanes				
Methylcyclopentane				
No. of Times Detected / No. of Samples	1 / 19	0 / 8	1 / 20	1 / 18
Range of Concentrations	NQ	ND	NQ	NQ

TABLE G - 1 - 16
PROCESS PERFORMANCE: 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
VOLATILE ORGANIC ANALYSIS (PURGE AND TRAP, GC/MS)
(Concentrations reported in ug/L)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES				
Halogenated Methanes (Other than THMs)				
Cyanogen chloride				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	5 / 18
Range of Concentrations	ND	ND	ND	NQ
Halogenated Ethanes				
1,2-Dichloro-1,1,2,2-tetrafluoroethane				
No. of Times Detected / No. of Samples	0 / 19	1 / 8	0 / 20	0 / 18
Range of Concentrations	ND	5.1	ND	ND
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-halogenated)				
Alkylbenzenes				
1-Ethyl-2-methylbenzene				
No. of Times Detected / No. of Samples	0 / 10	1 / 8	0 / 19	0 / 18
Range of Concentrations	ND	1.2	ND	ND
1-Ethyl-3-methylbenzene				
No. of Times Detected / No. of Samples	0 / 19	1 / 8	0 / 20	0 / 18
Range of Concentrations	ND	0.3	ND	ND
1-Ethyl-4-methylbenzene				
No. of Times Detected / No. of Samples	0 / 19	1 / 8	0 / 20	0 / 18
Range of Concentrations	ND	0.5	ND	ND
Methylethylbenzenes (a Methylethylbenzene isomers)				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	1 / 20	0 / 18
Range of Concentrations	ND	ND	0.2	ND
MISCELLANEOUS ORGANIC CHEMICALS				
Aldehydes				
Butanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	2 / 18
Range of Concentrations	ND	ND	ND	NQ
Decanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	1 / 18
Range of Concentrations	ND	ND	ND	NQ
Heptanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	1 / 18
Range of Concentrations	ND	ND	ND	NQ
Hexanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	1 / 18
Range of Concentrations	ND	ND	ND	NQ
2-Methylbutanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	3 / 18
Range of Concentrations	ND	ND	ND	NQ
2-Methylpentanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	1 / 18
Range of Concentrations	ND	ND	ND	NQ
2-Methylpropanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	2 / 18
Range of Concentrations	ND	ND	ND	NQ
Nonanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	3 / 18
Range of Concentrations	ND	ND	ND	NQ
Pentanal				
No. of Times Detected / No. of Samples	0 / 19	0 / 8	0 / 20	5 / 18
Range of Concentrations	ND	ND	ND	NQ
Alkanes				
Butane				
No. of Times Detected / No. of Samples	1 / 19	0 / 8	1 / 20	1 / 18
Range of Concentrations	NQ	ND	NQ	NQ
Hexane				
No. of Times Detected / No. of Samples	1 / 19	0 / 8	1 / 20	1 / 18
Range of Concentrations	NQ	ND	NQ	NQ
2-Methylbutane				
No. of Times Detected / No. of Samples	4 / 19	1 / 8	1 / 20	0 / 18
Range of Concentrations	NQ - 0.5	0.2	NQ	ND
Pentane				
No. of Times Detected / No. of Samples	1 / 19	0 / 8	0 / 20	0 / 18
Range of Concentrations	0.6	ND	ND	ND
Alkenes				
1-Butene				
No. of Times Detected / No. of Samples	4 / 19	1 / 8	3 / 20	3 / 18
Range of Concentrations	NQ - 0.3	0.6	NQ	NQ
Cyclic Alkanes				
Methylcyclopentane				
No. of Times Detected / No. of Samples	1 / 19	0 / 8	1 / 20	1 / 18
Range of Concentrations	NQ	ND	NQ	NQ

TABLE G - 1 - 17
PROCESS PERFORMANCE : 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
ACID EXTRACTION (W / METHYLATION) AND GC/MS
(Concentrations reported in ug/L)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)				
Alkylbenzenes				
Benzoic acid				
No. of Times Detected / No. of Samples	1 / 5	1 / 5	1 / 5	1 / 5
Range of Concentrations	7.0	2.0	2.0	10
MISCELLANEOUS ORGANIC CHEMICALS				
Organic Acids				
Dodecanoic acid				
No. of Times Detected / No. of Samples	4 / 5	4 / 5	2 / 5	2 / 5
Range of Concentrations	2 - 7	1 - 4	1 - 7	2 - 6
Hexadecanoic acid				
No. of Times Detected / No. of Samples	4 / 5	4 / 5	3 / 5	3 / 5
Range of Concentrations	2 - 36	1 - 5	1 - 2	3 - 5
13,16-Octadecadienoic				
No. of Times Detected / No. of Samples	1 / 5	0 / 5	0 / 5	0 / 5
Range of Concentrations	2.0	ND	ND	ND
Octadecanoic acid				
No. of Times Detected / No. of Samples	2 / 5	2 / 5	1 / 5	2 / 5
Range of Concentrations	3 - 18	1 - 4	2	4
Tetradecanoic acid				
No. of Times Detected / No. of Samples	4 / 5	3 / 5	1 / 5	2 / 5
Range of Concentrations	1 - 9	1 - 2	1	2

TABLE G - 1 - 18
PROCESS PERFORMANCE : 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
BASE/NEUTRAL EXTRACTION AND GC/MS

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water

(No secondary compounds were identified by this technique at any process site.)

TABLE G - 1 - 19
PROCESS PERFORMANCE : 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES				
Halogenated Ethanes				
1,1,1-Trichloroethane				
No. of Times Detected / No. of Samples	5 / 9	5 / 8	5 / 9	5 / 9
Range of Concentrations	.13 - 5.5	.13 - 2.5	.034 - 2.0	.053 - 2.2
Halogenated Alkanes (C3 or greater)				
1,2,3-Trichloropropane				
No. of Times Detected / No. of Samples	0 / 9	2 / 8	2 / 9	0 / 9
Range of Concentrations	ND	.0078 - .010	.0082 - .029	ND
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)				
Alkylbenzenes				
1,4-Diethylbenzene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.040	ND	ND
(1,1-Dimethylethyl)benzene				
No. of Times Detected / No. of Samples	0 / 9	2 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.021 - .044	ND	ND
1,4-Dimethyl-2-(1-methylethyl)benzene				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.029	ND	ND	ND
(1,1-Dimethylpropyl)benzene				
No. of Times Detected / No. of Samples	0 / 9	2 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.032 - .061	ND	ND
1-Ethyl-2,4-dimethylbenzene				
No. of Times Detected / No. of Samples	0 / 9	2 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.037 - .038	ND	ND
1-Ethyl-3,5-dimethylbenzene				
No. of Times Detected / No. of Samples	1 / 9	4 / 8	0 / 9	1 / 9
Range of Concentrations	.014	.015 - .059	ND	.0044
2-Ethyl-1,4-dimethylbenzene				
No. of Times Detected / No. of Samples	1 / 9	4 / 8	0 / 9	0 / 9
Range of Concentrations	.053	.020 - .037	ND	ND
4-Ethyl-1,2-dimethylbenzene				
No. of Times Detected / No. of Samples	3 / 9	4 / 8	1 / 9	2 / 9
Range of Concentrations	.016 - .026	.017 - .042	.0052	.0064 - .010
1-Ethyl-2-methylbenzene				
No. of Times Detected / No. of Samples	7 / 9	8 / 8	4 / 9	7 / 9
Range of Concentrations	.0034 - .077	.017 - .26	.0042 - .017	.0043 - .032
1-Ethyl-3-methylbenzene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.047	ND	ND
1-Ethyl-4-methylbenzene				
No. of Times Detected / No. of Samples	7 / 9	8 / 8	1 / 9	3 / 9
Range of Concentrations	.0037 - .048	.0062 - .170	.0046	.0076 - .011
1-Ethyl-4-(1-methylethyl)benzene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.065	ND	ND
(1-Methylethenyl)benzene				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	1 / 9	1 / 9
Range of Concentrations	ND	ND	.0041	.0052
(1-Methylethyl)benzene				
No. of Times Detected / No. of Samples	1 / 9	3 / 8	2 / 9	2 / 9
Range of Concentrations	.0076	.0034 - .066	.0022 - .0042	.0026 - .0070
1-Methyl-2-(1-methylethyl)benzene				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.0058	ND	ND	ND
1-Methyl-3-(1-methylethyl)benzene				
No. of Times Detected / No. of Samples	1 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	.012	.068	ND	ND
1-Methyl-2-propylbenzene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.038	ND	ND
1-Methyl-3-propylbenzene				
No. of Times Detected / No. of Samples	1 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	.015	.011	ND	ND
Pentamethylbenzene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.080	ND	ND
1,2,3,4-Tetramethylbenzene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.13	ND	ND
1,2,3,5-Tetramethylbenzene				
No. of Times Detected / No. of Samples	1 / 9	6 / 8	0 / 9	0 / 9
Range of Concentrations	.031	.0032 - .11	ND	ND
1,2,4,5-Tetramethylbenzene				
No. of Times Detected / No. of Samples	4 / 9	6 / 8	0 / 9	1 / 9
Range of Concentrations	.016 - .034	.0034 - .11	ND	.0077

TABLE G - 1 - 19
PROCESS PERFORMANCE : 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2,3-Trimethylbenzene				
No. of Times Detected / No. of Samples	7 / 9	8 / 8	6 / 9	6 / 9
Range of Concentrations	.021 - .120	.021 - .28	.0020 - .032	.0046 - .068
1,2,4-Trimethylbenzene				
No. of Times Detected / No. of Samples	5 / 9	8 / 8	4 / 9	4 / 9
Range of Concentrations	.020 - .037	.0054 - .130	.0042 - .0088	.0046 - .017
1,2,5-Trimethylbenzene				
No. of Times Detected / No. of Samples	0 / 9	2 / 8	1 / 9	1 / 9
Range of Concentrations	ND	.031 - .075	.0083	.016
1,3,5-Trimethylbenzene				
No. of Times Detected / No. of Samples	6 / 9	6 / 8	3 / 9	3 / 9
Range of Concentrations	.0053 - .092	.0099 - .36	.0047 - .0093	.0062 - .013
Phthalates				
Bis(2-ethylhexyl)phthalate				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	1 / 9	0 / 9
Range of Concentrations	ND	ND	.204	ND
Diethylphthalate				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.428	ND	ND	ND
Dibutylphthalate				
No. of Times Detected / No. of Samples	1 / 9	1 / 8	1 / 9	1 / 9
Range of Concentrations	.421	.192	.201	.055
Naphthalenes				
1,4-Dimethylnaphthalene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.0081	ND	ND
1,7-Dimethylnaphthalene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.070	ND	ND
2,7-Dimethylnaphthalene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.054	ND	ND
2-Methyldecahydronaphthalene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.0087	ND	ND
1-Methylnaphthalene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.012	ND	ND
2-Methylnaphthalene				
No. of Times Detected / No. of Samples	0 / 9	3 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.0038 - .018	ND	ND
2-Methyl-1,2,3,4-tetrahydronaphthalene				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.066	ND	ND	ND
1,2,3,4-Tetrahydro-2,6-dimethylnaphthalene				
No. of Times Detected / No. of Samples	0 / 9	2 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.041 - .076	ND	ND
1,2,3,4-Tetrahydro-5,6-dimethylnaphthalene				
No. of Times Detected / No. of Samples	1 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	.054	.0073	ND	ND
1,2,3,4-Tetrahydro-1-methylnaphthalene				
No. of Times Detected / No. of Samples	1 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	.053	.084	ND	ND
1,2,3,4-Tetrahydro-5-methylnaphthalene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.10	ND	ND
1,2,3,4-Tetrahydro-6-methylnaphthalene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.083	ND	ND
1,2,3,4-Tetrahydronaphthalene				
No. of Times Detected / No. of Samples	1 / 9	2 / 8	0 / 9	0 / 9
Range of Concentrations	.038	.014 - .14	ND	ND
Other multiring aromatics				
1,1-Dimethylindan				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.013	ND	ND
1,3-Dimethylindan				
No. of Times Detected / No. of Samples	0 / 9	2 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.0073 - .0095	ND	ND
4,6-Dimethylindan				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.047	ND	ND
5,6-Dimethylindan				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.017	ND	ND
Indan				
No. of Times Detected / No. of Samples	1 / 9	2 / 8	2 / 9	2 / 9
Range of Concentrations	.031	.046 - .049	.011 - .020	.017 - .029

TABLE G - 1 - 19
PROCESS PERFORMANCE : 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Indene				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	1 / 9	1 / 9
Range of Concentrations	ND	ND	.0032	.0080
4-Methylindan				
No. of Times Detected / No. of Samples	0 / 9	3 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.022 - .026	ND	ND
5-Methylindan				
No. of Times Detected / No. of Samples	0 / 9	2 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.014 - .093	ND	ND
MISCELLANEOUS ORGANIC CHEMICALS				
Ketones				
2,4-Dimethyl-3-hexanone				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.041	ND	ND	ND
1,1-Dichloro-2-propanone				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	1 / 9	1 / 9
Range of Concentrations	ND	.052	.017	.041
4,4-Dimethyl-2-pentanone				
No. of Times Detected / No. of Samples	0 / 9	2 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.011 - .024	ND	ND
6,10-Dimethyl-5,9-undecadiene-2-one				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.025	ND	ND
2-Hexanone				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.029	ND	ND
4-Methyl-2-pentanone				
No. of Times Detected / No. of Samples	2 / 9	2 / 8	2 / 9	2 / 9
Range of Concentrations	.051 - .060	.031 - .043	.028 - .067	.032 - .45
4,5-Octanedione				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	1 / 9
Range of Concentrations	ND	.035	ND	.053
Natural Odor Producing Compounds				
1-Methyl-4-(1-methylethyl)-7-oxabicyclo-(2.2.1)-heptane				
No. of Times Detected / No. of Samples	3 / 9	5 / 8	3 / 9	3 / 9
Range of Concentrations	.017 - .062	.0079 - .096	.0044 - .032	.015 - .025
1,3,3-Trimethylbicyclo-(2.2.1)heptan-2-ol				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	1 / 9
Range of Concentrations	ND	.022	ND	.0057
1,3,3-Trimethylbicyclo-(2.2.1)heptan-2-one				
No. of Times Detected / No. of Samples	2 / 9	2 / 8	2 / 9	2 / 9
Range of Concentrations	.011 - .070	.015 - .052	.0056 - .012	.0077 - .014
Alcohols				
Dimethylhexanol				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	0 / 9	1 / 9
Range of Concentrations	ND	ND	ND	.010
3,6-Dimethyl-3-octanol				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.053	ND	ND	ND
2-Methyl-1-butanol				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	ND	ND	ND	ND
2-Ethyl-4-methylpentanol				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	0 / 9	1 / 9
Range of Concentrations	ND	ND	ND	.012
Isooctanol				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	1 / 9	0 / 9
Range of Concentrations	ND	ND	.0052	ND
2-Ethyl-1-butanol				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.016	ND	ND
2-Ethylhexanol				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.040	ND	ND	ND
4-Methyl-2-propylpentanol				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	0 / 9	1 / 9
Range of Concentrations	ND	ND	ND	.0092
2-Propyl-1-heptanol				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.026	ND	ND
Aldehydes				
Decanal				
No. of Times Detected / No. of Samples	1 / 9	3 / 8	2 / 9	3 / 9
Range of Concentrations	.080	ND - .033	.0092 - .0093	.015 - .069
2-Ethylhexanal				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	0 / 9	1 / 9
Range of Concentrations	ND	ND	ND	.0088

TABLE G - 1 - 19
PROCESS PERFORMANCE : 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Nonanal				
No. of Times Detected / No. of Samples	1 / 9	1 / 8	1 / 9	2 / 9
Range of Concentrations	.18	.082	.011	.011 - .074
Heptanal				
No. of Times Detected / No. of Samples	2 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.013 - .044	ND	ND	ND
Hexanal				
No. of Times Detected / No. of Samples	4 / 9	5 / 8	0 / 9	1 / 9
Range of Concentrations	.0065 - .100	.019 - .061	ND	.044
Alkanes				
2,6-Dimethyloctane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.043	ND	ND	ND
2,7-Dimethyloctane				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.011	ND	ND
3,4-Dimethylpentane				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	0 / 9	1 / 9
Range of Concentrations	ND	ND	ND	.0039
2,6-Dimethylundecane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.054	ND	ND	ND
4,8-Dimethylundecane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.068	ND	ND	ND
Eicosane				
No. of Times Detected / No. of Samples	5 / 9	0 / 8	2 / 9	0 / 9
Range of Concentrations	.042 - .900	ND	.013 - .014	ND
5-Ethyl-2-methylheptane				
No. of Times Detected / No. of Samples	2 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.038 - .051	ND	ND	ND
Heneicosane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.026	ND	ND	ND
2,2,3,3,5,6,6-Heptamethylheptane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.099	ND	ND	ND
Hexadecane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.027	ND	ND	ND
7-Methyltridecane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.044	ND	ND	ND
Octadecane				
No. of Times Detected / No. of Samples	7 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.0061 - .145	ND	ND	ND
2,6,10,14-Tetramethylheptadecane				
No. of Times Detected / No. of Samples	6 / 9	0 / 8	1 / 9	0 / 9
Range of Concentrations	.015 - .100	ND	.011	ND
2,2,3,3-Tetramethylpentane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.063	ND	ND	ND
2,2,3,4-Tetramethylpentane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.054	ND	ND	ND
2,6,11-Trimethyldodecane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.095	ND	ND	ND
2,2,4-trimethylheptane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.030	ND	ND	ND
2,2,3-Trimethylhexane				
No. of Times Detected / No. of Samples	3 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	.013 - .17	.014	ND	ND
2,2,4-Trimethylhexane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.022	ND	ND	ND
2,2,5-Trimethylhexane				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.015	ND	ND	ND
2,3,3-Trimethylpentane				
No. of Times Detected / No. of Samples	1 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	.033	.0072	ND	ND
Alkenes				
2-Methyl-1-pentadecene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	1 / 9
Range of Concentrations	ND	.082	ND	.059

TABLE G - 1 - 19
PROCESS PERFORMANCE : 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
4,6,8-Trimethyl-1-nonene				
No. of Times Detected / No. of Samples	1 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.030	ND	ND	ND
2,2,4-Trimethyl-1-pentene				
No. of Times Detected / No. of Samples	2 / 9	0 / 8	0 / 9	0 / 9
Range of Concentrations	.046 - .220	ND	ND	ND
Cyclic Alkanes				
1-(1-Methylethyl)-2-nonylcyclopropane				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	1 / 9
Range of Concentrations	ND	.059	ND	.097
5-Methyl-2-(1-methylethyl)cyclohexanol				
No. of Times Detected / No. of Samples	0 / 9	2 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.028 - .057	ND	ND
1-Methyl-4-(1-methylethenyl)cyclohexane				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	1 / 9	1 / 9
Range of Concentrations	ND	ND	.0099	.0077
1-Methyl-4-(1-methylethyl)cyclohexane				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	0 / 9	1 / 9
Range of Concentrations	ND	ND	ND	.0062
Cyclic Alkenes				
1-(1-Cyclohexenyl-1-yl)-1-propanone				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	2 / 9	1 / 9
Range of Concentrations	ND	.051	.012 - .022	.0074
1-Methyl-4-(1-methylethenyl)cyclohexene				
No. of Times Detected / No. of Samples	3 / 9	1 / 8	2 / 9	2 / 9
Range of Concentrations	.015 - .038	.046	.0046 - .0062	.0029 - .071
Esters				
Butyl acetate				
No. of Times Detected / No. of Samples	0 / 9	0 / 8	0 / 9	1 / 9
Range of Concentrations	ND	ND	ND	.013
Heneicosanoic acid methyl ester				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.019	ND	ND
2-Methyl propanoic acid butyl ester				
No. of Times Detected / No. of Samples	2 / 9	2 / 8	0 / 9	0 / 9
Range of Concentrations	.065 - .261	.037 - .110	ND	ND

TABLE G-1-20
PROCESS PERFORMANCE
16 MARCH 1981 TO 16 MARCH 1982
AMES TEST

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
EEWTP Blended Influent (See Table F-20 for Results)					
Dual Media Filter Effluent (Note: Monitoring initiated in December 1981)					
8-Dec-1981					
	TA98	112.00	3.04	1.88	1.9
	TA98+S9	112.00	2.06	1.96	1.5
	TA100	112.00	6.78	9.97	1.4
	TA100+S9	112.00	-.95	12.04	1.5
29-Dec-1981					
	TA98	57.50	.93	1.99	1.3
	TA98+S9	57.50	2.86	2.05	1.8
	TA100	57.50	1.65	5.85	1.0
	TA100+S9	57.50	2.36	8.34	1.2
27-Jan-1982					
	TA98	83.30	1.45	1.55	1.5
	TA98+S9	83.30	2.65	2.03	2.2
	TA100	83.30	2.25	6.60	1.0
	TA100+S9	83.30	.97	3.12	1.1
9-Feb-1982					
	TA98	102.20	6.76	2.08	3.2
	TA98+S9	102.20	6.86	1.99	2.8
	TA100	102.20	27.63	5.68	2.2
	TA100+S9	102.20	10.72	2.73	1.5
23-Feb-1982					
	TA98	87.10	1.48	1.39	1.5
	TA98+S9	87.10	2.12	1.59	1.4
	TA100	87.10	5.61	4.24	1.2
	TA100+S9	87.10	4.70	3.50	1.2
2-Mar-1982					
	TA98	87.10	4.44	2.07	2.4
	TA98+S9	87.10	7.53	1.19	2.9
	TA100	87.10	8.54	7.36	1.3
	TA100+S9	87.10	7.58	4.11	1.3
9-Mar-1982					
	TA98	98.40	5.18	1.32	2.9
	TA98+S9	98.40	N.A.	N.A.	N.A.
	TA100	98.40	10.85	3.30	1.5
	TA100+S9	98.40	N.A.	N.A.	N.A.
16-Mar-1982					
	TA98	83.30	.71	1.08	1.2
	TA98+S9	83.30	-1.23	1.45	1.1
	TA100	83.30	-1.89	5.17	1.0
	TA100+S9	83.30	.09	7.14	1.1

TABLE G-1-20
PROCESS PERFORMANCE
16 MARCH 1981 TO 16 MARCH 1982
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		Final Carbon Column Effluent (Note: Monitoring initiated in December 1981)			
8-Dec-1981					
	TA98	102.00	1.50	1.41	1.6
	TA98+S9	102.00	1.88	2.53	1.4
	TA100	102.00	5.14	6.18	1.2
	TA100+S9	102.00	-1.16	4.50	1.1
29-Dec-1981					
	TA98	87.40	.72	.90	1.2
	TA98+S9	87.40	-.34	1.44	1.1
	TA100	87.40	.60	5.55	1.2
	TA100+S9	87.40	1.38	3.67	1.1
27-Jan-1982					
	TA98	85.20	1.45	1.43	1.4
	TA98+S9	85.20	1.68	1.79	2.0
	TA100	85.20	-5.25	4.01	1.
	TA100+S9	85.20	2.01	5.13	1.1
9-Feb-1982					
	TA98	94.60	1.06	1.61	1.2
	TA98+S9	94.60	.51	1.12	1.2
	TA100	94.60	3.74	6.82	1.0
	TA100+S9	94.60	3.64	4.76	1.2
10-Feb-1982					
	TA98	90.80	N.A.	N.A.	N.A.
	TA98+S9	90.80	N.A.	N.A.	N.A.
	TA100	90.80	N.A.	N.A.	N.A.
	TA100+S9	90.80	N.A.	N.A.	N.A.
23-Feb-1982					
	TA98	90.80	1.83	1.74	1.7
	TA98+S9	90.80	.61	3.00	1.4
	TA100	90.80	2.55	5.99	1.2
	TA100+S9	90.80	-1.05	5.14	1.2
2-Mar-1982					
	TA98	109.80	.10	.79	1.1
	TA98+S9	109.80	N.A.	N.A.	N.A.
	TA100	109.80	-2.12	3.90	1.1
	TA100+S9	109.80	N.A.	N.A.	N.A.
9-Mar-1982					
	TA98	94.60	.82	1.02	1.3
	TA98+S9	94.60	N.A.	N.A.	N.A.
	TA100	94.60	1.37	4.05	1.2
	TA100+S9	94.60	N.A.	N.A.	N.A.
16-Mar-1982					
	TA98	115.50	.25	1.13	1.1
	TA98+S9	115.50	-.41	1.30	1.3
	TA100	115.50	-.00	4.44	1.1
	TA100+S9	115.50	1.19	2.85	1.0
16-Mar-1982 (2nd set)					
	TA98	98.40	-.42	1.29	1.2
	TA98+S9	98.40	2.43	1.15	1.7
	TA100	98.40	8.45	6.22	1.4
	TA100+S9	98.40	.36	4.11	1.0
		EEWTP Finished Water (See Table H-20 for Results)			

1. Numbers refer to the size of the interval bracketing the corresponding specific activity value; i.e. Specific Activity ± Confidence Interval.

SECTION 2

PROCESS PERFORMANCE
17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)

OVERVIEW

This appendix provides statistical summary tables for the EEWTP process sites during the second alum phase of operation, Phase IB. The data summarized here was collected over a three and one half month period between 17 March 1982 and 6 July 1982.

The data are organized by parameter group, as indicated below:

G-2-1 Physical/Aesthetic Parameters
G-2-2 Asbestos Fibers
a. Concentration
b. Characterization
G-2-3 Major Cations, Anions and Nutrients
G-2-4 Trace Metals
G-2-5 Radiological Parameters
G-2-6 Microbiological Parameters
G-2-7 Viruses
G-2-8 Parasites
G-2-9 Organic Surrogate Parameters - TOC and TOX
G-2-10 Synthetic Organic Chemicals - Halogenated Alkanes
G-2-11 Synthetic Organic Chemicals - Halogenated Alkenes
G-2-12 Synthetic Organic Chemicals - Aromatic Hydrocarbons (Non-Halogenated)
G-2-13 Synthetic Organic Chemicals - Halogenated Aromatics
G-2-14 Synthetic Organic Chemicals - Pesticides/Herbicides
G-2-15 Synthetic Organic Chemicals - Miscellaneous Quantified Organic Chemicals
G-2-16 Organic chemicals Tentatively Identified by Volatile Organic Analysis (Purge and Trap GC/MS)
G-2-17 Organic Chemicals Tentatively Identified by Acid Extraction (w/Methylation) and GC/MS
G-2-18 Organic Chemicals Tentatively Identified by Base/Neutral Extraction and GC/MS
G-2-19 Organic Chemicals Tentatively Identified by Closed Loop Stripping and GC/MS
G-2-20 Ames Test Results

Process Performance
17 March 1982 To 6 July 1982 (Phase IB)

All data reported here are from 24-hour composite samples unless noted otherwise (next to the parameter name). In some cases, a negligible number of composite samples were missed, and grab samples taken in their place are included with the data analysis.

TABLE G-2-.
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
PHYSICAL/AESTHETIC PARAMETERS

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Temperature, deg. C [in-situ readings]						
No. of Readings	112					112
Arithmetic Mean	18.9					19.0
Standard Deviation	5.4					5.2
Median Value	21.0					20.5
Minimum Value	7.0					9.5
Maximum Value	26.0					26.5
pH [grab samples]						
No. of Readings	668	668 (Before pH control)	662 (After pH control; before ozonation and filtration)		1991	1333
Arithmetic Mean	6.9	6.4	7.8		8.0	7.6
Standard Deviation	0.3	0.3	0.3		0.4	0.2
Geometric Mean	6.9	6.4	7.8		8.0	7.5
Spread Factor	1.04	1.05	1.04		1.05	1.03
Median Value	6.9	6.4	7.8		8.1	7.6
Minimum Value	6.0	5.8	6.7		6.9	5.7
Maximum Value	7.8	7.3	8.9		9.1	8.8
Dissolved Oxygen [grab samples] (MDL=0.15 mg/l)						
No. of Readings	111	111	112	107		111
Arithmetic Mean	8.4	9.3	9.0	7.9		8.3
Standard Deviation	1.6	1.2	1.3	1.3		1.2
Geometric Mean	8.3	9.2	8.9	7.8		8.2
Spread Factor	1.23	1.14	1.15	1.17		1.15
Median Value	8.5	9.2	8.8	7.8		8.0
Minimum Value	4.1	6.2	5.8	5.2		6.2
Maximum Value	12.4	12.2	12.1	11.7		11.5
Turbidity [grab samples] (MDL= 0.05 NTU)						
No. of Samples	662	666 (After pH control)	1164		667	668
No. Above MDL	662	666	1164		667	668
Arithmetic Mean	24.14	3.50	0.17		0.09	0.11
Standard Deviation	31.93	2.13	0.34		0.03	0.05
Geometric Mean	15.32	3.09	0.14		0.09	0.10
Spread Factor	2.34	1.68	1.66		1.40	1.46
Median Value	13.00	3.00	0.15		0.10	0.10
90% Less Than	55.00	5.00	0.25		0.10	0.15
Total Suspended Solids (TSS) (MDL= 3.6 mg/l)						
No. of Samples	11	14	14		14	
No. Above MDL	11	13	0		0	
Arithmetic Mean	25.07	6.64	ND		ND	
Standard Deviation	19.33	3.85				
Geometric Mean	19.79	6.14				
Spread Factor	1.98	1.49				
Median Value	16.0	6.0	ND		ND	
90% Less Than	47.0	7.8	ND		ND	

TABLE G-2-1
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
PHYSICAL/AESTHETIC PARAMETERS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Apparent Color (MDL= 3 color units)						
No. of Samples	13		15			14
No. Above MDL	13		15			12
Arithmetic Mean	46.5		8.7			5.1
Standard Deviation	14.9		2.8			1.9
Geometric Mean	44.9		8.2			4.9
Spread Factor	1.29		1.45			1.43
Median Value	45		10			5
90% Less Than	55		10			7
MBAS (MDL= 0.03 mg/l)						
No. of Samples	2		3			4
No. Above MDL	2		2			4
Arithmetic Mean	0.050		0.025			0.035
Standard Deviation	0.014		0.009			0.006
Geometric Mean	0.049		0.030			0.035
Spread Factor	1.22		1.00			1.15
Median Value	0.04		0.03			0.03
90% Less Than	0.06		0.03			0.04
Odor (MDL= 1 TON)						
No. of Samples					23	23
No. Above MDL					23	23
Arithmetic Mean					6.0	11.5
Standard Deviation					5.3	4.9
Geometric Mean					4.1	10.4
Spread Factor					2.42	1.58
Median Value					3	12
90% Less Than					17	17
Free Chlorine [grab samples] (MDL= 0.1 mg/l-Cl)						
No. of Samples						738
No. Above MDL						738
Arithmetic Mean						2.42
Standard Deviation						0.67
Geometric Mean						2.14
Spread Factor						2.01
Median Value						2.5
90% Less Than						2.8
Total Chlorine [grab samples] (MDL= 0.1 mg/l-Cl)						
No. of Samples						736
No. Above MDL						736
Arithmetic Mean						2.83
Standard Deviation						0.77
Geometric Mean						2.76
Spread Factor						1.22
Median Value						2.7
90% Less Than						3.1

TABLE G-2-2 (A)
PROCESS PERFORMANCE
17 MARCH 1982 TO 6 JULY 1982
ASBESTOS FIBER CONCENTRATION

CHRYSOTILE FIBERS	EEWTP Blended Influent	EEWTP Finished Water
Summary Data:		
Total Number of Samples	13	16
Total Volume Filtered, Liters (VT)	0.101	0.804
Equivalent Volume Examined, Liters (V)	0.0000148	0.0001175
Percent Filter Area Examined (V/VT * 100)	0.01462	0.01462
Chrysotile Fiber Results:		
Total Fibers Counted (N)	87	2
Max. Concentration, MFL	35.035	0.274
Min. Concentration, MFL	N.D.	N.D.
Median Concentration, MFL	4.560	N.D.
90 Percentile Concentration, MFL	17.955	N.D.
Average Concentration (N/V), MFL	5.880	0.017
Minimum Detection Limits		
Highest, MFL	2.280	0.137
Lowest, MFL	0.698	0.132

AMPHIBOLE FIBERS	EEWTP Blended Influent	EEWTP Finished Water
Summary Data:		
Total Number of Samples	1	16
Total Volume Filtered, Liters (VT)	0.010	0.804
Equivalent Volume Examined, Liters (V)	0.0000014	0.0001175
Percent Filter Area Examined (V/VT * 100)	0.01462	0.01462
Amphibole Fiber Results:		
Total Fibers Counted (N)	1	0
Max. Concentration, MFL	0.698	N.D.
Min. Concentration, MFL	0.698	N.D.
Median Concentration, MFL	0.698	N.D.
90 Percentile Concentration, MFL	0.698	N.D.
Average Concentration (N/V), MFL	0.698	N.D.
Minimum Detection Limits		
Highest, MFL	0.698	0.137
Lowest, MFL	0.698	0.132

TABLE G-2-2 (B)
PROCESS PERFORMANCE
17 MARCH 1982 TO 6 JULY 1982
ASBESTOS FIBER CHARACTERIZATION

	EEWTP Blend Tank	EEWTP Finished Water
Chrysotile Fibers:		
Number of Fibers Examined *	80	0
Length Distribution,		
Fibers/Samples		
0.0 - 0.49 um	8/4	0/0
0.50 - 0.9 um	28/6	0/0
1.0 - 1.4 um	24/6	0/0
1.5 - 1.9 um	5/3	0/0
2.0 - 2.4 um	10/5	0/0
> 2.5 um	5/4	0/0
Width Distribution,		
Fibers/Samples		
0.00 - 0.04 um	5/3	0/0
0.05 - 0.09 um	59/6	0/0
0.10 - 0.14 um	11/4	0/0
0.15 - 0.19 um	4/2	0/0
0.20 - 0.24 um	0/0	0/0
> 2.5 um	1/1	0/0
Aspect Ratio Distribution,		
Fibers/Samples		
0.0 - 9.0	16/5	0/0
10.0 - 19.9	38/6	0/0
20.0 - 29.9	14/4	0/0
30.0 - 39.9	5/3	0/0
40.0 - 49.9	3/3	0/0
> 50.0	4/4	0/0
Amphibole Fibers:		
Number of Fibers Examined *	0	0
Length Distribution,		
Fibers/Samples		
0.0 - 0.49 um	0/0	0/0
0.50 - 0.9 um	0/0	0/0
1.0 - 1.4 um	0/0	0/0
1.5 - 1.9 um	0/0	0/0
2.0 - 2.4 um	0/0	0/0
> 2.5 um	0/0	0/0
Width Distribution,		
Fibers/Samples		
0.00 - 0.04 um	0/0	0/0
0.05 - 0.09 um	0/0	0/0
0.10 - 0.14 um	0/0	0/0
0.15 - 0.19 um	0/0	0/0
0.20 - 0.24 um	0/0	0/0
> 2.5 um	0/0	0/0
Aspect Ratio Distribution,		
Fibers/Samples		
0.0 - 9.0	0/0	0/0
10.0 - 19.9	0/0	0/0
20.0 - 29.9	0/0	0/0
30.0 - 39.9	0/0	0/0
40.0 - 49.9	0/0	0/0
> 50.0	0/0	0/0

* Only those fibers from samples with 5 or more fibers were used.

TABLE G-2-3
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
MAJOR CATIONS, ANIONS, AND NUTRIENTS

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Dissolved Solids (TDS)! by addition					
(MDL= 1 mg/l)					
No. of Samples	22		27		28
No. Above MDL	22		27		28
Arithmetic Mean	208.6		228.2		235.1
Standard Deviation	18.2		40.7		39.6
Geometric Mean	207.8		223.8		231.1
Spread Factor	1.09		1.23		1.22
Median Value	209	10	239		246
90% Less Than	223		263		268
Electroconductivity (grab samples at blended influent, composites elsewhere)					
(MDL= 0.1 umho/cm)					
No. of Samples	683		26		28
No. Above MDL	683		26		28
Arithmetic Mean	376.6		428.5		437.4
Standard Deviation	78.3		82.5		81.8
Geometric Mean	365.1		418.7		427.7
Spread Factor	1.31		1.26		1.26
Median Value	400.0		450.0		460.0
90% Less Than	440.0		520.0		520.0
Calcium					
(MDL= 0.2 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	32	32	32
Arithmetic Mean	42.24	55.67	49.64	49.50	49.91
Standard Deviation	4.48	9.87	7.41	7.52	7.42
Geometric Mean	42.02	54.73	49.00	48.84	49.27
Spread Factor	1.11	1.21	1.18	1.19	1.18
Median Value	42.0	57.4	51.9	51.8	51.7
90% Less Than	48.3	63.8	56.4	56.5	56.8
Hardness! by addition (Ca+Mg, as $CaCO_3$)					
(MDL= 1.0 mg/l-$CaCO_3$)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	32	32	32
Arithmetic Mean	134.7	167.9	151.8	151.3	152.3
Standard Deviation	13.5	28.6	22.4	22.8	22.4
Geometric Mean	134.0	165.2	149.9	149.3	150.5
Spread Factor	1.10	1.20	1.18	1.18	1.18
Median Value	134	171	156	156	156
90% Less Than	154	193	173	172	174
Magnesium					
(MDL= 0.1 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	32	32	32
Arithmetic Mean	7.09	7.01	6.77	6.72	6.73
Standard Deviation	0.74	1.13	1.05	1.07	1.06
Geometric Mean	7.05	6.91	6.68	6.63	6.64
Spread Factor	1.11	1.19	1.18	1.19	1.19
Median Value	7.0	7.2	6.9	6.9	6.8
90% Less Than	8.2	8.2	7.7	7.7	7.9

TABLE G-2-3
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Potassium (MDL= 0.3 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	32	32	32
Arithmetic Mean	5.17	4.66	4.59	4.62	4.63
Standard Deviation	0.58	1.32	1.12	1.12	1.14
Geometric Mean	5.15	4.41	4.39	4.42	4.43
Spread Factor	1.11	1.44	1.40	1.40	1.41
Median Value	5.1	4.9	4.9	4.9	5.0
90% Less Than	5.9	5.5	5.5	5.5	5.6
Sodium (MDL= 0.1 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	32	32	32
Arithmetic Mean	22.63	20.59	20.63	20.89	23.17
Standard Deviation	2.35	6.06	5.73	5.99	5.94
Geometric Mean	22.51	19.14	19.30	19.51	22.00
Spread Factor	1.11	1.56	1.53	1.54	1.44
Median Value	22.6	22.3	22.1	22.2	24.9
90% Less Than	26.2	25.5	25.2	25.4	28.2
Alkalinity (MDL= 2.7 mg/l-CaCO3)					
No. of Samples	23		27		28
No. Above MDL	23		27		28
Arithmetic Mean	56.78		59.07		61.79
Standard Deviation	14.51		13.50		11.91
Geometric Mean	54.87		57.54		60.65
Spread Factor	1.31		1.26		1.22
Median Value	59.0		57.0		61.0
90% Less Than	75.0		78.0		76.0
Bromide (MDL= 0.003 mg/l)					
No. of Samples	23		27		28
No. Above MDL	23		27		5
Arithmetic Mean	0.0734		0.0656		0.0044
Standard Deviation	0.0343		0.0394		0.0096
Geometric Mean	0.0651		0.0504		0.0004
Spread Factor	1.67		2.30		10.49
Median Value	0.067		0.064		ND
90% Less Than	0.120		0.12		0.014
Chloride (MDL= 0.1 mg/l)					
No. of Samples	23		27		28
No. Above MDL	23		27		28
Arithmetic Mean	45.74		39.93		43.39
Standard Deviation	5.29		13.64		13.71
Geometric Mean	45.45		35.77		39.68
Spread Factor	1.12		1.75		1.65
Median Value	45.0		44.0		47.0
90% Less Than	52.0		53.0		54.0

TABLE G-2-3
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Cyanide, Total (MDL= 0.005 mg/l)					
No. of Samples	26				32
No. Above MDL	11				0
Arithmetic Mean	0.0045				ND
Standard Deviation	0.0031				
Geometric Mean	0.0044				
Spread Factor	1.64				
Median Value	ND				ND
90% Less Than	0.007				ND
Fluoride (MDL= 0.10 mg/l)					
No. of Samples	23		27		28
No. Above MDL	23		24		25
Arithmetic Mean	0.45		0.24		0.25
Standard Deviation	0.08		0.10		0.10
Geometric Mean	0.44		0.22		0.23
Spread Factor	1.19		1.58		1.56
Median Value	0.4		0.3		0.3
90% Less Than	0.5		0.3		0.35
Nitrogen, Nitrite + Nitrate (MDL= 0.02 mg/l-N)					
No. of Samples	23		27	30	28
No. Above MDL	23		27	30	28
Arithmetic Mean	6.78		5.92	5.89	5.86
Standard Deviation	1.21		2.32	2.32	2.33
Geometric Mean	6.66		5.13	5.13	5.09
Spread Factor	1.21		1.91	1.87	1.87
Median Value	7.0		7.0	6.7	6.9
90% Less Than	8.1		7.8	7.8	8.0
Nitrogen, Ammonia (MDL= 0.02 mg/l-N)					
No. of Samples	23		27	31	28
No. Above MDL	21		18	14	9
Arithmetic Mean	0.295		0.215	0.090	0.046
Standard Deviation	0.445		0.445	0.200	0.123
Geometric Mean	0.127		0.038	0.015	0.008
Spread Factor	3.73		6.59	7.28	5.86
Median Value	0.11		0.03	ND	ND
90% Less Than	0.95		1.30	0.16	0.071
Nitrogen, Total Kjeldahl (MDL= 0.2 mg/l-N)					
No. of Samples	23		27	31	28
No. Above MDL	23		19	11	5
Arithmetic Mean	0.97		0.50	0.29	0.18
Standard Deviation	0.61		0.59	0.40	0.26
Geometric Mean	0.83		0.30	0.13	0.05
Spread Factor	1.70		2.71	3.62	4.24
Median Value	0.7		0.3	ND	ND
90% Less Than	1.7		1.8	0.6	0.25

TABLE G-2-3
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Ortho Phosphate (MDL= 0.01 mg/l-P)					
No. of Samples	23		27	31	28
No. Above MDL	23		3	2	4
Arithmetic Mean	0.212		0.011	0.008	0.031
Standard Deviation	0.084		0.017	0.012	0.113
Geometric Mean	0.199				
Spread Factor	1.41				
Median Value	0.19		ND	ND	ND
90% Less Than	0.39		0.04	ND	0.04
Silica (MDL= 0.2 mg/l)					
No. of Samples	23		27		28
No. Above MDL	23		27		28
Arithmetic Mean	7.90		6.53		6.23
Standard Deviation	1.80		1.73		1.78
Geometric Mean	7.67		6.30		5.97
Spread Factor	1.29		1.31		1.35
Median Value	8.4		6.7		6.0
90% Less Than	9.9		8.7		8.8
Sulfate (MDL= 0.6 mg/l)					
No. of Samples	23		27		28
No. Above MDL	23		27		28
Arithmetic Mean	38.51		61.19		60.05
Standard Deviation	4.64		7.48		7.78
Geometric Mean	38.24		60.73		59.52
Spread Factor	1.13		1.13		1.15
Median Value	39.0		62.0		62.0
90% Less Than	44.0		70.0		69.0

TABLE G-2-4
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
TRACE METALS

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Aluminum (MDL= 0.003 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	32	32	32
Arithmetic Mean	0.9115	1.2348	0.3169	0.1991	0.2081
Standard Deviation	0.7735	0.4510	0.2031	0.1317	0.1801
Geometric Mean	0.6214	1.1331	0.2668	0.1687	0.1601
Spread Factor	2.56	1.63	1.81	1.76	2.14
Median Value	0.610	1.260	0.250	0.150	0.150
90% Less Than	2.450	1.570	0.490	0.280	0.320
Arsenic (MDL= 0.0002 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	27	27	28	28
Arithmetic Mean	0.00130	0.00118	0.00046	0.00058	0.00058
Standard Deviation	0.00090	0.00259	0.00023	0.00030	0.00036
Geometric Mean	0.00110	0.00056	0.00042	0.00051	0.00050
Spread Factor	1.75	2.77	1.73	1.77	1.85
Median Value	0.0011	0.0005	0.0005	0.0006	0.0005
90% Less Than	0.0028	0.0012	0.0007	0.0009	0.0010
Barium (MDL= 0.002 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	32	31	32
Arithmetic Mean	0.0427	0.0315	0.0285	0.0247	0.0253
Standard Deviation	0.0236	0.0111	0.0072	0.0080	0.0062
Geometric Mean	0.0383	0.0296	0.0276	0.0228	0.0246
Spread Factor	1.57	1.45	1.29	1.68	1.28
Median Value	0.037	0.031	0.027	0.023	0.024
90% Less Than	0.075	0.041	0.038	0.033	0.031
Boron (MDL= 0.0040 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	31	31	32
Arithmetic Mean	0.05014	0.06906	0.04689	0.04786	0.04720
Standard Deviation	0.02099	0.07569	0.01839	0.02055	0.01747
Geometric Mean	0.04561	0.05565	0.04151	0.04203	0.04370
Spread Factor	1.60	1.75	1.83	1.84	1.51
Median Value	0.0505	0.0549	0.0505	0.0481	0.0449
90% Less Than	0.0689	0.0916	0.0693	0.0678	0.0690
Cadmium: furnace AAS (MDL= 0.0002 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	16	11	11	6	6
Arithmetic Mean	0.00035	0.00026	0.00017	0.00012	0.00022
Standard Deviation	0.00042	0.00031	0.00011	0.00005	0.00029
Geometric Mean	0.00023	0.00013	0.00016	0.00016	0.00004
Spread Factor	2.47	3.28	1.74	1.22	6.62
Median Value	0.0002	ND	ND	ND	ND
90% Less Than	0.0009	0.0007	0.0003	0.0002	0.0006

TABLE G-2-4
PROCESS PERFORMANCE — 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chromium: furnace AAS					
(MDL= 0.0002 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	28	29	28	29
Arithmetic Mean	0.00638	0.00183	0.00154	0.00129	0.00131
Standard Deviation	0.00341	0.00117	0.00165	0.00095	0.00101
Geometric Mean	0.00560	0.00131	0.00107	0.00090	0.00095
Spread Factor	1.67	2.69	2.44	2.70	2.42
Median Value	0.0056	0.0020	0.0011	0.0011	0.0009
90% Less Than	0.0130	0.0032	0.0023	0.0026	0.0025
Copper: flame AAS					
(MDL= 0.0012 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	26	31	24	10	21
Arithmetic Mean	0.00963	0.00423	0.00220	0.00099	0.00138
Standard Deviation	0.00554	0.00230	0.00118	0.00067	0.00074
Geometric Mean	0.00830	0.00376	0.00200	0.00091	0.00137
Spread Factor	1.81	1.61	1.73	1.78	1.50
Median Value	0.0084	0.0038	0.0023	ND	0.0013
90% Less Than	0.0147	0.0058	0.0033	0.0017	0.0024
Iron					
(MDL= 0.003 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	29	28	28
Arithmetic Mean	1.7981	0.3796	0.0334	0.0230	0.0348
Standard Deviation	1.1191	0.1842	0.0364	0.0292	0.0642
Geometric Mean	1.5673	0.3177	0.0208	0.0120	0.0167
Spread Factor	1.65	2.04	2.89	3.32	3.34
Median Value	1.480	0.390	0.023	0.014	0.017
90% Less Than	3.210	0.630	0.063	0.040	0.056
Lead					
(MDL= 0.0003 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	26	13	10	7	7
Arithmetic Mean	0.00698	0.00072	0.00046	0.00030	0.00023
Standard Deviation	0.02009	0.00174	0.00084	0.00043	0.00017
Geometric Mean	0.00206	0.00022	0.00014	0.00010	0.00016
Spread Factor	3.81	4.41	4.54	3.99	2.24
Median Value	0.0014	ND	ND	ND	ND
90% Less Than	0.0099	0.0010	0.0006	0.0005	0.0006
Lithium: flame AAS					
(MDL= 0.0004 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	32	32	32
Arithmetic Mean	0.00554	0.00514	0.00480	0.00505	0.00735
Standard Deviation	0.00276	0.00354	0.00344	0.00367	0.01663
Geometric Mean	0.00516	0.00444	0.00416	0.00435	0.00451
Spread Factor	1.40	1.67	1.68	1.69	2.00
Median Value	0.0049	0.0045	0.0042	0.0045	0.0042
90% Less Than	0.0078	0.0068	0.0058	0.0062	0.0067

TABLE G-2-4
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Manganese (MDL= 0.0010 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	32	19	27
Arithmetic Mean	0.31330	0.14345	0.03471	0.00587	0.00921
Standard Deviation	0.35399	0.09346	0.05085	0.01250	0.01229
Geometric Mean	0.23655	0.11876	0.01898	0.00165	0.00456
Spread Factor	1.91	1.84	2.82	5.48	3.63
Median Value	0.2060	0.1000	0.0158	0.0017	0.0059
90% Less Than	0.5430	0.2440	0.0536	0.0089	0.0203
Mercury (MDL= 0.00027 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	2	5	5	5	11
Arithmetic Mean	0.00015	0.00018	0.00021	0.00020	0.00026
Standard Deviation	0.00006	0.00012	0.00021	0.00021	0.00022
Geometric Mean		0.00013	0.00007	0.00009	0.00020
Spread Factor		2.20	3.86	3.08	2.17
Median Value	ND	ND	ND	ND	ND
90% Less Than	ND	0.0004	0.0003	0.0003	0.0005
Nickel (MDL= 0.0010 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	26	24	18	21	18
Arithmetic Mean	0.00681	0.00420	0.00347	0.00334	0.00341
Standard Deviation	0.00516	0.00589	0.00495	0.00401	0.00482
Geometric Mean	0.00522	0.00258	0.00146	0.00184	0.00145
Spread Factor	2.14	2.78	4.25	3.23	4.20
Median Value	0.0046	0.0028	0.0016	0.0021	0.0020
90% Less Than	0.0126	0.0076	0.0062	0.0064	0.0084
Selenium (MDL= 0.0002 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	4	7	7	16	7
Arithmetic Mean	0.00022	0.00029	0.00020	0.00035	0.00021
Standard Deviation	0.00042	0.00049	0.00025	0.00047	0.00035
Geometric Mean		0.00004	0.00007	0.00018	0.00006
Spread Factor		7.69	3.91	3.10	4.31
Median Value	ND	ND	ND	ND	ND
90% Less Than	0.0002	0.0008	0.0003	0.0007	0.0004
Silver: furnace AAS (MDL= 0.0002 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	20	6	2	2	2
Arithmetic Mean	0.00077	0.00016	0.00011	0.00013	0.0[illegible]12
Standard Deviation	0.00089	0.00015	0.00002	0.00013	0.00[illegible]09
Geometric Mean	0.00041	0.00008			
Spread Factor	3.22	2.85			
Median Value	0.0004	ND	ND	ND	ND
90% Less Than	0.0024	0.0003	ND	ND	ND

TABLE G-2-4
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Titanium (MDL= 0.0020 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	26	23	2	1	1
Arithmetic Mean	0.0249	0.0076	0.0013	0.0010	0.0010
Standard Deviation	0.0199	0.0052	0.0013	0.0002	0.0002
Geometric Mean	0.0194	0.0054			
Spread Factor	2.13	2.67			
Median Value	0.0193	0.0077	ND	ND	ND
90% Less Than	0.0408	0.0140	ND	ND	ND
Vanadium (MDL= 0.0020 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	22	11	7	4	5
Arithmetic Mean	0.00456	0.00229	0.00155	0.00147	0.00138
Standard Deviation	0.00232	0.00227	0.00130	0.00131	0.00122
Geometric Mean	0.00412	0.00143	0.00107		0.00082
Spread Factor	1.72	2.69	2.26		2.37
Median Value	0.0048	ND	ND	ND	ND
90% Less Than	0.0070	0.0042	0.0026	ND	0.0022
Zinc: flame AAS (MDL= 0.0012 mg/l)					
No. of Samples	27	31	32	32	32
No. Above MDL	27	31	31	29	32
Arithmetic Mean	0.03466	0.02302	0.00806	0.00743	0.01656
Standard Deviation	0.02336	0.01637	0.00922	0.01333	0.02943
Geometric Mean	0.02939	0.01964	0.00546	0.00405	0.00926
Spread Factor	1.73	1.70	2.31	2.67	2.49
Median Value	0.0264	0.0197	0.0052	0.0038	0.0077
90% Less Than	0.0713	0.0345	0.0127	0.0081	0.0286

TABLE G-2-5
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
RADIOLOGICAL PARAMETERS

	Blended Influent	EEWTP Finished Water
Gross Alpha (MDL= 0.1 pCi/l)		
No. of Samples	7	7
No. Above MDL	5	2
Arithmetic Mean	0.63	0.24
Standard Deviation	0.46	0.34
Geometric Mean	0.37	0.03
Spread Factor	3.80	11.69
Median Value	0.6	ND
90% Less Than	1.3	0.9
Gross Alpha 2s Error (MDL= 0.1 pCi/l)		
No. of Samples	7	7
No. Above MDL	7	7
Arithmetic Mean	0.66	0.40
Standard Deviation	0.17	0.20
Geometric Mean	0.64	0.36
Spread Factor	1.25	1.61
Median Value	0.6	0.3
90% Less Than	1.0	0.7
Gross Beta (MDL= 0.1 pCi/l)		
No. of Samples	7	7
No. Above MDL	7	7
Arithmetic Mean	6.93	5.06
Standard Deviation	1.38	0.69
Geometric Mean	6.80	5.02
Spread Factor	1.23	1.14
Median Value	7.2	5.2
90% Less Than	8.9	5.9
Gross Beta 2s Error (MDL= 0.1 pCi/l)		
No. of Samples	7	7
No. Above MDL	7	7
Arithmetic Mean	1.31	1.16
Standard Deviation	0.12	0.05
Geometric Mean	1.31	1.16
Spread Factor	1.09	1.04
Median Value	1.3	1.2
90% Less Than	1.5	1.2
Strontium-90 (Note: Analyzed only for selected dates where Gross Beta + 2 sigma > 8 pCi/L at plant sites) (MDL= 0.2 pCi/l)		
No. of Samples	1	
No. Above MDL	0	
Arithmetic Mean	ND	
Median Value	ND	
90% Less Than	ND	

TABLE G-2-5
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
RADIOLOGICAL PARAMETERS
(Continued)

	Blended Influent	EEWTP Finished Water
Strontium-90 2s error (MDL= 0.2 pCi/l)		
No. of Samples	1	
No. Above MDL	0	
Arithmetic Mean	0.3	
Median Value	0.3	
90% Less Than	0.3	
Tritium (MDL=1000 pCi/l)		
No. of Samples	1	2
No. Above MDL	0	0
Arithmetic Mean	ND	ND
Median Value	ND	ND
90% Less Than	ND	ND

TABLE G-2-6
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
MICROBIOLOGICAL PARAMETERS

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Coliform (confirmed): 1000,100,10 ml volumes [grab samples]				
(MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)				
No. of Samples				68
No. of Positives				19
No. of TNTC				0
Geometric Mean				0.0084
Spread Factor				3.35
Median Value				ND
90% Less Than				0.040
Maximum Value				0.230
Total Coliform (confirmed): 100,10,1 ml volumes [grab samples]				
(MDL=0.18 MPN/100 ml;UQL=240 MPN/100 ml)				
No. of Samples		15	72	
No. of Positives		15	72	
No. of TNTC		0	0	
Geometric Mean		28.367	9.350	
Spread Factor		7.03	3.28	
Median Value		54.00	8.40	
90% Less Than		240.00	54.00	
Maximum Value		240.00	240.00	
Total Coliform (confirmed): 0.1,0.01,0.001 ml volumes [grab samples]				
(MDL=180 MPN/100 ml;UQL=240000 MPN/100 m)				
No. of Samples	13			
No. of Positives	13			
No. of TNTC	1			
Geometric Mean	21623.7			
Spread Factor	2.44			
Median Value	22000			
90% Less Than	35000			
Maximum Value	>UQL			
Total Coliform (completed): 1000,100,10 ml volumes [grab samples]				
(MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)				
No. of Samples				69
No. of Positives				14
No. of TNTC				0
Geometric Mean				0.0065
Spread Factor				3.24
Median Value				ND
90% Less Than				0.020
Maximum Value				0.230
Fecal Coliform (confirmed): 1000,100,10 ml volumes [grab samples]				
(MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)				
No. of Samples				71
No. of Positives				3
No. of TNTC				0
Median Value				ND
90% Less Than				ND
Maximum Value				0.020

TABLE G-2-6

MICROBIOLOGICAL PARAMETERS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Fecal Coliform (confirmed): 100,10,1 ml volumes [grab samples]				
(MDL=0.18 MPN/100 ml;UQL=240 MPN/100 ml)				
No. of Samples		15	69	
No. of Positives		13	55	
No. of TNTC		0	0	
Geometric Mean		2.347	0.647	
Spread Factor		9.88	4.71	
Median Value		2.70	0.50	
90% Less Than		54.00	4.90	
Maximum Value		54.00	13.00	
Fecal Coliform (confirmed): 0.1,0.01,0.001 ml volumes [grab samples]				
(MDL=180 MPN/100 ml;UQL=240000 MPN/100 m)				
No. of Samples	13			
No. of Positives	13			
No. of TNTC	0			
Geometric Mean	4872.3			
Spread Factor	2.24			
Median Value	4900			
90% Less Than	11000			
Maximum Value	24000			
Standard Plate Count: 1 ml volume [grab samples]				
(MDL=1.0 colonies/ml)				
No. of Samples		14	74	75
No. of Positives		14	74	16
Geometric Mean		478.1	175.0	0.4
Spread Factor		5.05	3.23	3.40
Median Value		253	154	ND
90% Less Than		4400	760	2
Maximum Value		5125	4300	14
Standard Plate Count: 0.01 ml volume [grab samples]				
(MDL=100 colonies/ml)				
No. of Samples	13			
No. of Positives	13			
Geometric Mean	15950.4			
Spread Factor	2.54			
Median Value	13650			
90% Less Than	38000			
Maximum Value	160000			
Salmonella: 1000 ml volume [grab samples]				
(MDL=0.022 MPN/100 ml;UQL= 0.16 MPN/100 ml)				
No. of Samples				3
No. of Positives				0
No. of TNTC				0
Median Value				ND
90% Less Than				ND
Maximum Value				ND

TABLE G-2-6

MICROBIOLOGICAL PARAMETERS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Salmonella: 100 ml volume [grab samples]				
(MDL=0.22 MPN/100 ml;UQL= 1.6 MPN/100 ml)				
No. of Samples	3			
No. of Positives	2			
No. of TNTC	0			
Geometric Mean	Not			
Spread Factor	Calculated			
Median Value	0.22			
90% Less Than	0.22			
Maximum Value	0.22			
Endotoxin [grab samples]				
(MDL=0.006 ng/ml)				
No. of Samples				1
No. Above MDL				1
Arithmetic Mean				2.5000
Geometric Mean				2.500
Spread Factor				1.000
Median Value				2.500
90% Less Than				2.500

TABLE G-2-7 (A)
PROCESS PERFORMANCE
16 MARCH 1982 TO 6 JULY 1982
VIRUS ASSAY

EEWTP Blended Influent (See Table F-7 for Results)
EEWTP Finished Water (See Table H-7 for Results)

TABLE G-2-8
PROCESS PERFORMANCE
16 MARCH 1982 TO 6 JULY 1982
PARASITES

EEWTP Blend Tank

Samples Assayed:	3
Total Volume Filtered (Gallons):	465.0
Total Equivalent Volume (Gallons):	352.5
Samples with Unknown Volume:	0
Samples with Unknown Equiv. Volume:	0

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

EEWTP Finished Water

Samples Assayed:	4
Total Volume Filtered (Gallons):	1617.0
Total Equivalent Volume (Gallons):	337.1
Samples with Unknown Volume:	0
Samples with Unknown Equiv. Volume:	0

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

TABLE G-2-9
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
ORGANIC SURROGATE PARAMETERS -- TOC AND TOX

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Organic Carbon: DC80 (MDL=0.06 mg/l-C)						
No. of Samples	51	62	62	53	59	41
No. Above MDL	51	62	62	53	59	41
Arithmetic Mean	4.72	2.71	2.10	1.58	1.25	1.30
Standard Deviation	1.10	0.48	0.34	0.39	0.41	0.39
Geometric Mean	4.63	2.66	2.08	1.52	1.16	1.23
Spread Factor	1.21	1.22	1.17	1.33	1.54	1.44
Median Value	4.7	2.8	2.1	1.6	1.3	1.3
90% Less Than	5.3	3.2	2.4	1.9	1.7	1.8
Total Organic Carbon: DC80 [grab samples] (MDL=0.06 mg/l-C)						
No. of Samples	107	107	107	104	107	107
No. Above MDL	107	107	107	104	107	107
Arithmetic Mean	4.19	2.87	2.50	1.93	1.57	1.59
Standard Deviation	0.61	0.47	0.41	0.53	0.52	0.52
Geometric Mean	4.15	2.83	2.47	1.86	1.47	1.49
Spread Factor	1.15	1.20	1.18	1.33	1.48	1.48
Median Value	4.1	2.9	2.5	1.9	1.6	1.6
90% Less Than	4.8	3.3	3.0	2.4	2.2	2.1
Total Organic Halogen (MDL=3.9 ug/l-Cl)						
No. of Samples	51	63	62	49	60	41
No. Above MDL	51	63	62	49	60	40
Arithmetic Mean	79.02	50.24	35.24	25.86	19.18	39.00
Standard Deviation	23.79	13.95	9.85	10.29	11.30	18.93
Geometric Mean	76.70	47.99	33.59	24.22	17.06	32.28
Spread Factor	1.25	1.38	1.40	1.53	1.80	2.08
Median Value	75.0	50.0	35.0	25.0	20.0	40.0
90% Less Than	95.0	65.0	45.0	40.0	30.0	60.0

TABLE G-2-10
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chloroform: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	52	61	61	52	57	41
No. Detected	52	55	56	46	38	36
No. Above MDL	52	54	54	42	29	34
Arithmetic Mean	1.81	1.11	1.01	0.82	0.68	2.35
Standard Deviation	0.76	0.49	0.43	0.55	0.96	1.95
Geometric Mean	1.68	1.00	0.91	0.67	0.32	1.47
Spread Factor	1.44	1.78	1.76	2.06	3.79	3.22
Median Value	1.6	1.2	1.1	0.7	0.3	2.1
90% Less Than	2.6	1.6	1.4	1.3	2.4	5.2
Chloroform: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	6		8		8	8
No. Detected	6		6		6	8
No. Above MDL	6		4		4	7
Arithmetic Mean	1.72		0.38		0.38	1.47
Standard Deviation	1.40		0.36		0.45	0.96
Geometric Mean	1.41		0.22		0.20	1.08
Spread Factor	1.79		3.07		3.21	2.55
Median Value	1.3		NQ		NQ	1.3
90% Less Than	4.5		0.9		1.4	3.2
Maximum Value	4.5		0.9		1.4	3.2
Bromodichloromethane: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	52	61	61	52	57	41
No. Detected	52	53	54	37	11	40
No. Above MDL	29	16	12	6	7	34
Arithmetic Mean	0.38	0.22	0.20	0.23	0.22	2.36
Standard Deviation	0.36	0.11	0.07	0.27	0.43	1.66
Geometric Mean	0.29	0.24	Not			1.56
Spread Factor	1.96	1.33	Calculated			3.11
Median Value	0.3	NQ	NQ	NQ	ND	2.5
90% Less Than	0.5	0.3	0.3	NQ	1.2	3.6
Bromodichloromethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	6		8		8	8
No. Detected	3		1		1	7
No. Above MDL	2		0		1	7
Arithmetic Mean	0.27		NQ		0.12	1.56
Standard Deviation	0.41				0.19	0.85
Geometric Mean	0.10					1.19
Spread Factor	4.12					2.56
Median Value	ND		ND		ND	1.7
90% Less Than	1.1		NQ		0.6	2.6
Maximum Value	1.1		NQ		0.6	2.6
Bromodichloromethane: CLS GCMS						
(IDL= 0.001 ug/l;MDL= 0.070 ug/l)						
No. of Samples	6		7		3	6
No. Detected	6		7		4	6
No. Above MDL	5		6		3	6
Arithmetic Mean	0.1686		0.1582		0.2764	0.9683
Standard Deviation	0.1632		0.0912		0.6593	0.9634
Geometric Mean	0.1277		0.1388		0.0328	0.666[illegible]
Spread Factor	2.09		1.77		9.58	2.37
Median Value	0.120		0.120		ND	0.510
90% Less Than	0.490		0.270		1.900	2.800
Maximum Value	0.490		0.270		1.900	2.800

TABLE G-2-10
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Dibromochloromethane: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	52	61	61	52	57	41
No. Detected	46	44	44	10	7	40
No. Above MDL	14	12	7	5	7	36
Arithmetic Mean	0.23	0.14	0.13	0.09	0.09	3.30
Standard Deviation	0.30	0.06	0.06	0.10	0.10	2.36
Geometric Mean	0.09	0.17				2.06
Spread Factor	3.03	1.22				3.55
Median Value	NQ	NQ	NQ	ND	ND	3.9
90% Less Than	0.2	0.2	0.2	NQ	0.3	5.5
Dibromochloromethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		1	7
No. Above MDL	0		0		0	7
Arithmetic Mean	ND		ND		NQ	1.71
Standard Deviation						1.12
Geometric Mean						1.30
Spread Factor						2.43
Median Value	ND		ND		ND	1.8
90% Less Than	ND		ND		NQ	3.0
Maximum Value	ND		ND		NQ	3.0
Dibromochloromethane: CLS GCMS						
(IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	6		7		8	6
No. Detected	6		7		4	6
No. Above MDL	3		2		2	6
Arithmetic Mean	0.1248		0.0456		0.0604	4.0717
Standard Deviation	0.1648		0.0353		0.1063	5.4814
Geometric Mean	0.0552		0.0328		0.0149	1.7877
Spread Factor	3.98		2.31		6.89	4.45
Median Value	NQ		NQ		ND	2.400
90% Less Than	0.450		0.110		0.300	15.000
Maximum Value	0.450		0.110		0.300	15.000
Bromoform: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	52	61	61	52	57	41
No. Detected	3	0	0	0	0	29
No. Above MDL	3	0	0	0	0	29
Arithmetic Mean	0.07	ND	ND	ND	ND	1.20
Standard Deviation	0.08					1.09
Geometric Mean						0.64
Spread Factor						4.06
Median Value	ND	ND	ND	ND	ND	1.1
90% Less Than	ND	ND	ND	ND	ND	2.1
Bromoform: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	5
No. Above MDL	0		0		0	4
Arithmetic Mean	ND		ND		ND	0.47
Standard Deviation						0.39
Geometric Mean						0.62
Spread Factor						1.36
Median Value	ND		ND		ND	NQ
90% Less Than	ND		ND		ND	0.9
Maximum Value	ND		ND		ND	0.9

TABLE G-2-10
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Bromoform: CLS GCMS						
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)						
No. of Samples	6		7		8	6
No. Detected	3		2		1	6
No. Above MDL	1		0		0	5
Arithmetic Mean	0.0191		NQ		NQ	1.2604
Standard Deviation	0.0232					2.2744
Geometric Mean	Not					0.2623
Spread Factor	Calculated					6.94
Median Value	ND		ND		ND	0.140
90% Less Than	0.062		NQ		NQ	5.800
Maximum Value	0.062		NQ		NQ	5.800
Dichloroiodomethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Total Trihalomethanes: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	52	61	61	52	57	42
No. Detected	52	56	56	46	38	42
No. Above MDL	52	54	54	44	33	39
Arithmetic Mean	2.36	1.37	1.25	1.01	0.89	9.16
Standard Deviation	1.42	0.58	0.51	0.88	1.52	5.68
Geometric Mean	2.11	1.15	1.06	0.71	0.28	5.77
Spread Factor	1.54	2.15	2.11	2.60	5.10	3.95
Median Value	2.0	1.5	1.4	0.8	0.3	10.1
90% Less Than	3.1	1.9	1.7	1.5	3.9	14.0
Bromochloromethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Bromomethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-2-10
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Carbon Tetrachloride: LLE ECD (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	52	62	61	52	57	41
No. Detected	3	2	2	1	15	3
No. Above MDL	0	0	0	0	2	0
Arithmetic Mean	NQ	NQ	NQ	NQ	0.08	NQ
Standard Deviation					0.05	
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	NQ	ND
Carbon Tetrachloride: purge & trap GCMS (IDL= 0.3 ug/l;MDL= 0.5 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Chloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Dichlorodifluoromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Dichloromethane (Methylene chloride): purge & trap GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-2-10
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Iodoform: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Trichlorofluoromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		1		1	1
No. Above MDL	0		0		0	1
Arithmetic Mean	ND		NQ		NQ	0.11
Standard Deviation						0.16
Median Value	ND		ND		ND	ND
90% Less Than	ND		NQ		NQ	0.5
Maximum Value	ND		NQ		NQ	0.5
Chloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dibromoethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dibromoethane: CLS GCMS (IDL= 0.002 ug/l;MDL= 0.050 ug/l)						
No. of Samples	6		7		8	6
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1-Dichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-2-10
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2-Dichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachloroethane: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.050 ug/l)						
No. of Samples	6		7		8	6
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachloroethane: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 7.5 ug/l)						
No. of Samples	4		4		4	4
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1,2,2-Tetrachloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-2-10
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,1,2,2-Tetrachloroethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	6		7		8	6
No. Detected	1		1		2	2
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		NQ	NQ
Median Value	ND		ND		ND	ND
90% Less Than	NQ		NQ		NQ	NQ
Maximum Value	NQ		NQ		NQ	NQ
1,1,1-Trichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	6		8		8	8
No. Detected	4		1		1	0
No. Above MDL	2		0		1	0
Arithmetic Mean	0.17		NQ		0.11	ND
Standard Deviation	0.13				0.16	
Geometric Mean	0.15					
Spread Factor	1.78					
Median Value	NQ		ND		ND	ND
90% Less Than	0.4		NQ		0.5	ND
Maximum Value	0.4		NQ		0.5	ND
1,1,2-Trichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1,2-Trichloroethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.070 ug/l)						
No. of Samples	6		7		8	6
No. Detected	1		2		2	0
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	NQ		NQ		NQ	ND
Maximum Value	NQ		NQ		NQ	ND
1,2-Dibromo-3-chloropropane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-2-10
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2-Dichloropropane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dichloropropane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.080 ug/l)						
No. of Samples	6		7		8	6
No. Detected	4		3		0	0
No. Above MDL	1		1		0	0
Arithmetic Mean	0.0537		0.0504		ND	ND
Standard Deviation	0.0743		0.0986			
Geometric Mean	Not					
Spread Factor	Calculated					
Median Value	NQ		ND		ND	ND
90% Less Than	NQ		0.270		ND	ND
Maximum Value	0.200		0.270		ND	ND

TABLE G-2-11
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chloroethene (Vinyl chloride): purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
cis-1,2-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
trans-1,2-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Tetrachloroethene: LLE ECD (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	52	61	61	52	57	41
No. Detected	52	60	60	30	33	14
No. Above MDL	50	31	15	1	12	1
Arithmetic Mean	1.08	0.48	0.37	0.17	0.22	0.13
Standard Deviation	0.90	0.38	0.34	0.10	0.13	0.14
Geometric Mean	0.87	0.39	0.22		0.29	
Spread Factor	1.86	1.92	2.38		1.46	
Median Value	0.8	0.4	NQ	NQ	NQ	ND
90% Less Than	1.8	0.9	0.6	NQ	0.4	NQ

TABLE G-2-11
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Tetrachloroethene: purge & trap GCMS (IDL= 0.2 ug/l;MDL= 0.5 ug/l)						
No. of Samples	6		8		8	8
No. Detected	6		2		1	0
No. Above MDL	5		1		0	0
Arithmetic Mean	1.26		0.26		NQ	ND
Standard Deviation	1.47		0.35			
Geometric Mean	0.82					
Spread Factor	2.36					
Median Value	0.6		ND		ND	ND
90% Less Than	4.2		1.1		NQ	ND
Maximum Value	4.2		1.1		NQ	ND
Tetrachloroethene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.020 ug/l)						
No. of Samples	6		7		8	6
No. Detected	6		7		8	3
No. Above MDL	6		7		8	3
Arithmetic Mean	1.3117		0.3214		0.1893	0.0612
Standard Deviation	1.8164		0.3209		0.1388	0.0741
Geometric Mean	0.7907		0.2341		0.1557	0.0241
Spread Factor	2.39		2.09		1.83	5.14
Median Value	0.510		0.170		0.110	ND
90% Less Than	5.000		1.000		0.480	0.160
Maximum Value	5.000		1.000		0.480	0.160
Trichloroethene: LLE ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	52	61	61	52	57	41
No. Detected	28	3	2	1	15	2
No. Above MDL	2	0	1	1	14	0
Arithmetic Mean	0.14	NQ	0.06	0.05	0.20	NQ
Standard Deviation	0.09		0.04	0.03	0.28	
Geometric Mean					0.15	
Spread Factor					2.96	
Median Value	NQ	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND	0.6	ND
Trichloroethene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.7 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		2	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		NQ	ND
Maximum Value	ND		ND		NQ	ND
Trichloroethene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.130 ug/l)						
No. of Samples	6		7		8	6
No. Detected	2		2		4	0
No. Above MDL	2		2		4	0
Arithmetic Mean	0.0367		0.0159		0.0693	ND
Standard Deviation	0.0803		0.0296		0.0825	
Geometric Mean	Not				0.0946	
Spread Factor	Calculated				1.61	
Median Value	ND		ND		ND	ND
90% Less Than	0.200		0.078		0.217	ND
Maximum Value	0.200		0.078		0.217	ND

TABLE G-2-11
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
cis-1,2-Dichloropropene: Purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
cis-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
trans-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachlorobutadiene: purge & trap GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)						
No. of Samples	6		8		8	8
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachlorobutadiene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	6		7		8	6
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-2-11
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Hexachlorobutadiene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=12.0 ug/l)						
No. of Samples	4		4		4	4
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Benzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Ethenylbenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL=NA ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Ethenylbenzene: CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.020 ug/l)				
No. of Samples	6	7	8	6
No. Detected	2	5	7	4
No. Above MDL	0	1	1	2
Arithmetic Mean	NQ	0.0114	0.0157	0.0128
Standard Deviation		0.0076	0.0135	0.0094
Geometric Mean				0.0185
Spread Factor				1.23
Median Value	ND	NQ	NQ	NQ
90% Less Than	NQ	0.025	0.048	0.025
Maximum Value	NQ	0.025	0.048	0.025
Ethylbenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Ethylbenzene: CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)				
No. of Samples	6	7	8	6
No. Detected	3	5	7	6
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	NQ	NQ
Median Value	ND	NQ	NQ	NQ
90% Less Than	NQ	NQ	NQ	NQ
Maximum Value	NQ	NQ	NQ	NQ

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Propylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.3 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	NQ	ND
Maximum Value	ND	ND	NQ	ND
Propylbenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.010 ug/l)				
No. of Samples	6	7	8	6
No. Detected	2	4	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	NQ	ND	ND
90% Less Than	NQ	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
Toluene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	6	8	8	8
No. Detected	1	0	0	0
No. Above MDL	1	0	0	0
Arithmetic Mean	0.08	ND	ND	ND
Standard Deviation	0.06			
Geometric Mean	Not			
Spread Factor	Calculated			
Median Value	ND	ND	ND	ND
90% Less Than	0.2	ND	ND	ND
Maximum Value	0.2	ND	ND	ND
Toluene: CLS GCMS (IDL= 0.020 ug/l;MDL= 0.090 ug/l)				
No. of Samples	6	7	8	6
No. Detected	4	6	6	3
No. Above MDL	3	3	4	2
Arithmetic Mean	0.1185	0.1036	0.0986	0.0520
Standard Deviation	0.1317	0.0846	0.0922	0.0518
Geometric Mean	0.0906	0.0822	0.0890	0.0791
Spread Factor	2.44	2.18	1.94	1.37
Median Value	NQ	NQ	NQ	ND
90% Less Than	0.350	0.220	0.290	0.130
Maximum Value	0.350	0.220	0.290	0.130
1,2-Xylene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	1	0
No. Above MDL	0	0	1	0
Arithmetic Mean	ND	ND	0.07	ND
Standard Deviation			0.05	
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	0.2	ND
Maximum Value	ND	ND	0.2	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2-Xylene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.030 ug/l)				
No. of Samples	6	7	8	6
No. Detected	4	6	6	6
No. Above MDL	0	2	0	2
Arithmetic Mean	NQ	0.0244	NQ	0.0222
Standard Deviation		0.0192		0.0073
Geometric Mean		0.0209		0.0289
Spread Factor		1.95		1.08
Median Value	NQ	NQ	NQ	NQ
90% Less Than	NQ	0.062	NQ	0.033
Maximum Value	NQ	0.062	NQ	0.033
1,3-Xylene/1,4-Xylene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	NQ	ND
Maximum Value	ND	ND	NQ	ND
1,3-Xylene/1,4-Xylene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.040 ug/l)				
No. of Samples	6	7	8	6
No. Detected	3	5	6	6
No. Above MDL	0	1	0	2
Arithmetic Mean	NQ	0.0200	NQ	0.0298
Standard Deviation		0.0145		0.0116
Geometric Mean				0.0375
Spread Factor				1.17
Median Value	ND	NQ	NQ	NQ
90% Less Than	NQ	0.045	NQ	0.048
Maximum Value	NQ	0.045	NQ	0.048
Nitrobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 2.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Methyl-2,4-dinitrobenzene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Methyl-2,6-Dinitrobenzene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL=10.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzylbutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l; MDL= 7.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL= 8.0 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Di-n-Butylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 9.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dicyclohexylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l; MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Diethylphthalate: Base neut. LLE GCMS (IDL= 0.1 ug/l; MDL= 9.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Diisobutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l; MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dimethylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL=10.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dioctylphthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL= 8.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Diphenylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l; MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Phenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dimethylphenol: Acid LLE (w/ methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dinitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Methyl-4,6-dinitrophenol: Acid LLE (w/ methyl.) GCMS (IDL=10.0 ug/l;MDL=NA ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Nitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
4-Nitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthene: CLS GCMS (IDL= 0.010 ug/l;MDL=NA ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 3.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthylene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Napthalene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Napthalene: CLS GCMS				
(IDL= 0.010 ug/l;MDL= 0.040 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	1	1
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	NQ
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	NQ	NQ
Maximum Value	ND	ND	NQ	NQ
Napthalene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l;MDL= 2.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Anthracene: CLS GCMS				
(IDL= 0.050 ug/l;MDL= 0.090 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Anthracene: Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 6.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzidine: Base neut. LLE GCMS				
(IDL=50.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Benzo(b)fluoranthene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL=10.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(k)fluoranthene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL=10.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(g,h,i)perylene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL=20.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(a)pyrene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL=10.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(a)anthracene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL= 7.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chrysene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL= 6.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dibenzo(a,h)anthracene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL= 9.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
3,3'-Dichlorobenzidine: Base neut. LLE GCMS (IDL= 5.0 ug/l; MDL= 8.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Diphenylhydrazine/Azobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 7.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Diphenylhydrazine/Azobenzene: CLS GCMS (IDL= 0.005 ug/l; MDL= 0.100 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Fluoranthene: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 5.0 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Fluorene: Base neut. LLE GCMS (IDL= 0.1 ug/l; MDL= 3.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Fluorene: CLS GCMS (IDL= 0.010 ug/l; MDL= 0.080 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene: Base neut. LLE GCMS (IDL= 5.0 ug/l; MDL=30.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Phenanthrene: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 5.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-12
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Phenanthrene: CLS GCMS (IDL= 0.050 ug/l;MDL= 0.120 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Pyrene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Bromobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Bromobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Bromobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Chlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Chlorobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.020 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
4-Chloro-1-methylbenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chloro-1-methylbenzene: CLS GCMS				
(IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Dichlorobenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	6	8	8	8
No. Detected	2	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND
Maximum Value	NQ	ND	ND	ND
1,2-Dichlorobenzene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Dichlorobenzene: CLS GCMS				
(IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	6	7	8	6
No. Detected	6	4	1	1
No. Above MDL	5	0	0	0
Arithmetic Mean	0.0417	NQ	NQ	NQ
Standard Deviation	0.0289			
Geometric Mean	0.0362			
Spread Factor	1.77			
Median Value	0.036	NQ	ND	ND
90% Less Than	0.095	NQ	NQ	NQ
Maximum Value	0.095	NQ	NQ	NQ

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,3-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	6	8	8	8
No. Detected	1	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND
Maximum Value	NQ	ND	ND	ND
1,3-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	6	7	8	6
No. Detected	6	4	3	1
No. Above MDL	5	2	0	0
Arithmetic Mean	0.0515	0.0186	NQ	NQ
Standard Deviation	0.0478	0.0271		
Geometric Mean	0.0383	0.0103		
Spread Factor	2.19	3.63		
Median Value	0.028	NQ	ND	ND
90% Less Than	0.140	0.072	NQ	NQ
Maximum Value	0.140	0.072	NQ	NQ
1,4-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	6	8	8	8
No. Detected	1	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND
Maximum Value	NQ	ND	ND	ND
1,4-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 6.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,4-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	6	7	8	6
No. Detected	6	4	3	1
No. Above MDL	4	1	0	0
Arithmetic Mean	0.0258	0.0078	NQ	NQ
Standard Deviation	0.0133	0.0087		
Geometric Mean	0.0258			
Spread Factor	1.50			
Median Value	0.024	NQ	ND	ND
90% Less Than	0.038	0.024	NQ	NQ
Maximum Value	0.038	0.024	NQ	NQ
Hexachlorobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 2.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Hexachlorobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.050 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloro-2-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloro-3-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloro-4-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2,3-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2,3-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)				
No. of Samples	6	7	8	6
No. Detected	1	1	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
1,2,4-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2,4-Trichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 8.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2,4-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	6	7	8	6
No. Detected	4	2	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3,5-Trichlorobenzene: Purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3,5-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 5.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloro-3-methylphenol: Acid LLE Methyl GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
3-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 9.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chloro-3-methylphenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Pentachlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 4.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
2,3,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,3,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l;MDL=NA ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
2-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l:MDL=NA ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloronaphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l:MDL= 9.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloronaphthalene: CLS GCMS (IDL= 0.001 ug/l:MDL= 0.050 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloronaphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l:MDL= 2.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloronaphthalene: CLS GCMS (IDL= 0.001 ug/l:MDL= 0.050 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Arochlor 1016: LLE ECD				
(IDL= 0.2 ug/l:MDL= 0.4 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1221: LLE ECD				
(IDL= 0.2 ug/l:MDL= 0.4 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1232: LLE ECD				
(IDL= 0.2 ug/l:MDL= 0.4 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1242: LLE ECD				
(IDL= 0.2 ug/l:MDL= 0.4 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1248: LLE ECD				
(IDL= 0.2 ug/l:MDL= 0.4 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-13
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Arochlor 1254: LLE ECD (IDL= 0.1 ug/l;MDL= 0.4 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1260: LLE ECD (IDL= 0.1 ug/l;MDL= 0.4 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-14
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Aldrin: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Atrazine: Base neut. LLE GCMS				
(IDL= 5.0 ug/l;MDL= 9.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Alpha-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.20 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Beta-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.20 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Delta-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-14
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Gamma-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.02 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Chlordane: LLE ECD				
(IDL= 0.01 ug/l;MDL=NA ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4,4'-DDD: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4,4'-DDE: LLE ECD				
(IDL= 0.01 ug/l;MDL= 1.00 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4,4'-DDT: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.09 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-14
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Dieldrin: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endrin: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.07 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endosulfan I: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endosulfan II: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endosulfan sulfate: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.02 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-14
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Heptachlor: LLE ECD				
(IDL= 0.01 ug/l:MDL= 0.20 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Heptachlor epoxide: LLE ECD				
(IDL= 0.01 ug/l:MDL= 0.10 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Hexachlorocyclopentadiene: Base neut. LLE GCMS				
(IDL= 1.0 ug/l:MDL=20.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Hexachlorocyclopentadiene: CLS GCMS				
(IDL= 0.010 ug/l:MDL= 0.340 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean				
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Kepone: LLE ECD				
(IDL= 0.01 ug/l:MDL= 2.00 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-14
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Methoxychlor: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.09 ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Toxaphene: LLE ECD				
(IDL= 0.01 ug/l;MDL=NA ug/l)				
No. of Samples	3	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,3,7,8-Tetrachlorodibenzo-p-dioxin: Base neut. LLE GCMS				
(IDL=10.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Tricresolphosphate: Base neut. LLE GCMS				
(IDL=50.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-D: LLE (w/ methyl.) ECD				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-14
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
2,4,5-T: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4,5-TP: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-15
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
N-Nitrosodimethylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL=10.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
N-Nitrosodiphenylamine: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 5.0 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
N-Nitrosodipropylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Bromo-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Bromo-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-15
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloro-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 8.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloro-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloroethylvinylether: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloroethylvinylether: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,1'-(Methylenebis(oxy))-bis-2-chloroethane: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-2-15
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,1'-Oxybis(2-chloroethane): Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 4.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,1'-Oxybis(2-chloroethane): CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.080 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,2'-Oxybis(2-chloropropane): Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Tetrahydrofuran: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acetone: purge & trap GCMS				
(IDL= 0.5 ug/l;MDL= 0.5 ug/l)				
No. of Samples	6	8	8	8
No. Detected	1	2	2	2
No. Above MDL	1	2	2	2
Arithmetic Mean	0.59	0.73	0.43	0.60
Standard Deviation	0.84	0.91	0.35	0.89
Geometric Mean	Not	0.15	0.28	0.17
Spread Factor	Calculated	7.12	2.42	4.72
Median Value	ND	ND	ND	ND
90% Less Than	2.3	2.6	1.2	2.8
Maximum Value	2.3	2.6	1.2	2.8

TABLE G-2-15
PROCESS PERFORMANCE -- 17 MARCH 1982 TO 6 JULY 1982 (PHASE IB)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
2-Butanone: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 1.0 ug/l)				
No. of Samples	6	8	8	8
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Isophorone: Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples	4	4	4	4
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Geosmin: CLS GCMS				
(IDL= 0.0005 ug/l;MDL= 0.0500 ug/l)				
No. of Samples	6	7	8	6
No. Detected	1	1	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
Methylisoborneol: CLS GCMS				
(IDL= 0.0005 ug/l;MDL= 0.0400 ug/l)				
No. of Samples	6	7	8	6
No. Detected	0	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	NQ	ND
Maximum Value	ND	ND	NQ	ND

TABLE G - 2 - 16
PROCESS PERFORMANCE : 16 MARCH 1982 - 16 JULY 1982 (PHASE IB)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
VOLATILE ORGANIC ANALYSIS (PURGE AND TRAP, GC/MS)
(Concentrations reported in ug/L)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES				
Halogenated Methanes (Other Than THMs)				
Dichlorofluoromethane				
No. of Times Detected / No. of Samples	0 / 6	0 / 9	1 / 8	0 / 8
Range of Concentrations	ND	ND	2.5	ND
Halogenated Ethanes				
1,2-Dichloro-1,1,2,2-tetrafluoroethane				
No. of Times Detected / No. of Samples	1 / 6	1 / 9	1 / 8	1 / 8
Range of Concentrations	0.9	4.1	1.7	4.1
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)				
Alkylbenzenes				
Methylethylbenzenes (& Methylethylbenzene isomers)				
No. of Times Detected / No. of Samples	0 / 6	0 / 9	1 / 8	0 / 8
Range of Concentrations	ND	ND	4.2	ND
1,2,3-Trimethylbenzene				
No. of Times Detected / No. of Samples	0 / 6	0 / 9	1 / 8	0 / 8
Range of Concentrations	ND	ND	4.9	ND
MISCELLANEOUS ORGANIC CHEMICALS				
Alkanes				
Butane				
No. of Times Detected / No. of Samples	0 / 6	0 / 9	0 / 8	1 / 8
Range of Concentrations	ND	ND	ND	0.7
2,4-Dimethylpentane				
No. of Times Detected / No. of Samples	1 / 6	0 / 9	0 / 8	1 / 8
Range of Concentrations	0.1	ND	ND	0.1
Hexane				
No. of Times Detected / No. of Samples	0 / 6	1 / 9	0 / 8	0 / 8
Range of Concentrations	ND	0.1	ND	ND
2-Methylbutane				
No. of Times Detected / No. of Samples	1 / 6	0 / 9	0 / 8	0 / 8
Range of Concentrations	0.4	ND	ND	ND
2-Methylpropane				
No. of Times Detected / No. of Samples	1 / 6	1 / 9	0 / 8	0 / 8
Range of Concentrations	1.0	0.8	ND	ND
Ethers				
Dimethoxypropane				
No. of Times Detected / No. of Samples	1 / 6	0 / 9	0 / 8	0 / 8
Range of Concentrations	0.4	ND	ND	ND
1,1'-Dimethoxypropane				
No. of Times Detected / No. of Samples	2 / 6	2 / 9	2 / 8	2 / 8
Range of Concentrations	0.4 - 0.7	0.3 - 0.4	0.3	0.2 - 0.3
1,1'-Oxybisethane				
No. of Times Detected / No. of Samples	3 / 6	1 / 9	0 / 8	1 / 8
Range of Concentrations	0.4 - 1.1	0.5	ND	NQ
1,1'-Oxybismethane				
No. of Times Detected / No. of Samples	1 / 6	0 / 9	1 / 8	0 / 8
Range of Concentrations	0.6	ND	0.8	ND
2,2'-Oxybispropane				
No. of Times Detected / No. of Samples	3 / 6	0 / 9	0 / 8	0 / 8
Range of Concentrations	0.1 - 0.3	ND	ND	ND

TABLE G - 2 - 17
PROCESS PERFORMANCE : 16 MARCH 1982 - 16 JULY 1982 (PHASE IB)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
ACID EXTRACTION (W / METHYLATION) AND GC/MS
(Concentrations reported in ug/L)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
MISCELLANEOUS ORGANIC CHEMICALS				
Organic Acids				
Hexadecanoic acid				
No. of Times Detected / No. of Samples	1 / 3	1 / 4	1 / 4	0 / 4
Range of Concentrations	0.3	0.4	0.1	ND
Octadecanoic acid				
No. of Times Detected / No. of Samples	1 / 3	1 / 4	0 / 4	0 / 4
Range of Concentrations	0.2	0.2	ND	ND
Tetradecanoic acid				
No. of Times Detected / No. of Samples	1 / 4	1 / 4	1 / 4	1 / 4
Range of Concentrations	0.4	0.2	0.1	0.2

TABLE G - 2 - 18
PROCESS PERFORMANCE : 16 MARCH 1982 - 16 JULY 1982 (PHASE IB)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
BASE/NEUTRAL EXTRACTION AND GC/MS
(Concentrations reported in ug/L)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)				
Phenols				
2,6-Bis(1,1-Dimethylethyl)-4-methylphenol				
No. of Times Detected / No. of Samples	1 / 4	1 / 4	1 / 4	1 / 4
Range of Concentrations	2.3	2.2	1.9	1.9

TABLE G - 2 - 19
PROCESS PERFORMANCE : 16 MARCH 1982 - 16 JULY 1982 (PHASE IB)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES				
Halogenated Alkanes (C3 or greater)				
1,2,3-Trichloropropane				
No. of Times Detected / No. of Samples	0 / 6	1 / 7	1 / 8	0 / 6
Range of Concentrations	ND	.0031	.0041	ND
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)				
Alkylbenzenes				
1,3-Diethylbenzene				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.0086	ND	ND	ND
1-Ethyl-2-methylbenzene				
No. of Times Detected / No. of Samples	2 / 6	5 / 7	3 / 8	3 / 6
Range of Concentrations	.029 - .036	.012 - .032	.0077 - .012	.015 - .022
1-Ethyl-4-methylbenzene				
No. of Times Detected / No. of Samples	1 / 6	1 / 7	0 / 8	1 / 6
Range of Concentrations	.009	.0059	ND	.017
1,2,3-Trimethylbenzene				
No. of Times Detected / No. of Samples	4 / 6	6 / 7	4 / 8	3 / 6
Range of Concentrations	.0062 - .036	.011 - .025	.0084 - .015	.0057 - .018
1,2,4-Trimethylbenzene				
No. of Times Detected / No. of Samples	2 / 6	2 / 7	1 / 8	0 / 6
Range of Concentrations	.014 - .084	.0038 - .0073	.0018	ND
Naphthalenes				
Acenaphthylene				
No. of Times Detected / No. of Samples	0 / 9	1 / 8	0 / 9	0 / 9
Range of Concentrations	ND	.0005	ND	ND
MISCELLANEOUS ORGANIC CHEMICALS				
Ketones				
2,2-Dimethyl-3-hexanone				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.016	ND	ND	ND
2,6-Dimethyl-5,9-undecadiene-2-one				
No. of Times Detected / No. of Samples	0 / 6	1 / 7	1 / 8	0 / 6
Range of Concentrations	ND	.0098	.0091	ND
2-Hexanone				
No. of Times Detected / No. of Samples	0 / 6	1 / 7	0 / 8	0 / 6
Range of Concentrations	ND	.053	ND	ND
4-Hydroxy-4-methyl-2-pentanone				
No. of Times Detected / No. of Samples	1 / 6	1 / 7	0 / 8	0 / 6
Range of Concentrations	.022	.030	ND	ND
Isophorone				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.160	ND	ND	ND
5-Methyl-2-hexanone				
No. of Times Detected / No. of Samples	0 / 6	1 / 7	0 / 8	0 / 6
Range of Concentrations	ND	.027	ND	ND
Alcohols				
3-Methyl-1-butanol				
No. of Times Detected / No. of Samples	0 / 6	1 / 7	0 / 8	0 / 6
Range of Concentrations	ND	.0030	ND	ND
Isooctanol				
No. of Times Detected / No. of Samples	0 / 6	0 / 7	1 / 8	0 / 6
Range of Concentrations	ND	ND	.0056	ND
2-Ethylhexanol				
No. of Times Detected / No. of Samples	0 / 6	1 / 7	0 / 8	0 / 6
Range of Concentrations	ND	.0086	ND	ND
8-Methyl-1,8-nonanediol				
No. of Times Detected / No. of Samples	0 / 6	1 / 7	0 / 8	0 / 6
Range of Concentrations	ND	.0056	ND	ND
6-Methyl-1-octanol				
No. of Times Detected / No. of Samples	1 / 6	1 / 7	0 / 8	0 / 6
Range of Concentrations	.0067	.0058	ND	ND
Aldehydes				
Decanal				
No. of Times Detected / No. of Samples	3 / 6	4 / 7	3 / 8	1 / 6
Range of Concentrations	.0079 - .018	.010 - .024	.0053 - .027	.0078
3,3-Dimethylhexanal				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.0028	ND	ND	ND
2-Ethylhexanal				
No. of Times Detected / No. of Samples	0 / 6	0 / 7	0 / 8	1 / 6
Range of Concentrations	ND	ND	ND	.019

TABLE G - 2 - 19
PROCESS PERFORMANCE : 16 MARCH 1982 - 16 JULY 1982 (PHASE IB)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Nonanal				
No. of Times Detected / No. of Samples	2 / 6	3 / 7	3 / 8	0 / 6
Range of Concentrations	.012 - .031	.011 - .018	.011 - .022	ND
Heptanal				
No. of Times Detected / No. of Samples	0 / 6	0 / 7	1 / 8	0 / 6
Range of Concentrations	ND	ND	.0042	ND
Hexanal				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	1 / 8	0 / 6
Range of Concentrations	.018	ND	.0075	ND
4-Methylhexanal				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.0040	ND	ND	ND
Tetradecanal				
No. of Times Detected / No. of Samples	0 / 6	2 / 7	0 / 8	0 / 6
Range of Concentrations	ND	.0015 - .020	ND	ND
Alkanes				
2,4-Dimethylheptane				
No. of Times Detected / No. of Samples	0 / 6	1 / 7	0 / 8	0 / 6
Range of Concentrations	ND	.010	ND	ND
2,5-Dimethylheptane				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.010	ND	ND	ND
Eicosane				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.0077	ND	ND	ND
5-Ethyl-2-methylheptane				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.0090	ND	ND	ND
Hexadecane				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.0045	ND	ND	ND
Octadecane				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.026	ND	ND	ND
2,2,4,6,6-Pentamethylheptane				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.012	ND	ND	ND
2,6,10,14-Tetramethylheptadecane				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.022	ND	ND	ND
2,2,4-Trimethylhexane				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.014	ND	ND	ND
Alkenes				
7-Methyl-6-tridecene				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.011	ND	ND	ND
4,6,8-Trimethyl-1-nonene				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.0040	ND	ND	ND
Cyclic Alkanes				
1-Ethenyl-2-hexenylcyclopropane				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.025	ND	ND	ND
3,3,5-Trimethylcyclohexanone				
No. of Times Detected / No. of Samples	0 / 6	1 / 7	0 / 8	0 / 6
Range of Concentrations	ND	.022	ND	ND
Esters				
Butyl acetate				
No. of Times Detected / No. of Samples	0 / 6	0 / 7	0 / 8	1 / 6
Range of Concentrations	ND	ND	ND	.023
2-Methyl propanoic acid butyl ester				
No. of Times Detected / No. of Samples	1 / 6	3 / 7	2 / 8	0 / 6
Range of Concentrations	.046	.015 - .045	.017 - .021	ND
Sulfur containing organic compounds				
Dimethyldisulfide				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.011	ND	ND	ND
Dimethyltrisulfide				
No. of Times Detected / No. of Samples	1 / 6	0 / 7	0 / 8	0 / 6
Range of Concentrations	.0058	ND	ND	ND

TABLE G-2-20
PROCESS PERFORMANCE
16 MARCH 1982 TO 6 JULY 1982
AMES TEST

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		EEWTP Blended Influent (See Table F-20 for Results)			
		Dual Media Filter Effluent			
16-Mar-1982					
	TA98	83.30	.71	1.08	1.2
	TA98+S9	83.30	-1.23	1.45	1.1
	TA100	83.30	-1.89	5.17	1.0
	TA100+S9	83.30	.09	7.14	1.1
17-Mar-1982					
	TA98	87.10	2.32	1.71	1.6
	TA98+S9	87.10	2.85	1.56	1.7
	TA100	87.10	4.08	5.17	1.2
	TA100+S9	87.10	5.08	5.28	1.1
30-Mar-1982					
	TA98	106.00	2.08	.94	1.9
	TA98+S9	106.00	2.56	1.46	2.3
	TA100	106.00	2.17	4.29	1.2
	TA100+S9	106.00	4.98	4.99	1.5
31-Mar-1982					
	TA98	83.30	2.03	1.93	1.5
	TA98+S9	83.30	3.07	1.65	1.7
	TA100	83.30	5.56	3.78	1.2
	TA100+S9	83.30	8.46	7.28	1.4
6-Apr-1982					
	TA98	94.60	.46	1.07	1.2
	TA98+S9	94.60	2.09	1.18	1.8
	TA100	94.60	-2.17	4.29	1.0
	TA100+S9	94.60	1.66	3.15	1.2
7-Apr-1982					
	TA98	87.10	.97	1.24	1.4
	TA98+S9	87.10	1.15	.80	1.5
	TA100	87.10	-3.80	4.21	1.0
	TA100+S9	87.10	2.48	4.71	1.1
20-Apr-1982					
	TA98	60.60	1.87	1.64	1.4
	TA98+S9	60.60	2.18	2.42	1.4
	TA100	60.60	-.62	8.42	1.1
	TA100+S9	60.60	-1.49	8.02	1.1
27-Apr-1982					
	TA98	87.10	.67	1.51	1.3
	TA98+S9	87.10	1.58	2.16	1.4
	TA100	87.10	3.59	4.76	1.2
	TA100+S9	87.10	3.69	5.31	1.3
28-Apr-1982					
	TA98	113.60	.77	.89	1.4
	TA98+S9	113.60	.12	.81	1.
	TA100	113.60	-.73	4.49	1.
	TA100+S9	113.60	-1.02	3.20	1.1
4-May-1982					
	TA98	87.10	2.51	1.38	1.9
	TA98+S9	87.10	1.83	7.93	4.2
	TA100	87.10	8.48	7.46	1.4
	TA100+S9	87.10	4.10	5.74	1.3
11-May-1982					
	TA98	64.30	3.09	2.33	1.7
	TA98+S9	64.30	-.60	3.33	1.1
	TA100	64.30	N.A.	N.A.	N.A.
	TA100+S9	64.30	N.A.	N.A.	N.A.
12-May-1982					
	TA98	98.40	6.00	1.78	3.8
	TA98+S9	98.40	2.89	1.22	2.2
	TA100	98.40	-1.0	4.90	1.2
	TA100+S9	98.40	-2.81	2.91	1.1
25-May-1982					
	TA98	98.40	.46	1.13	1.1
	TA98+S9	98.40	-.12	1.40	1.1
	TA100	98.40	-.44	3.68	1.1
	TA100+S9	98.40	.85	3.89	1.
26-May-1982					
	TA98	90.80	2.13	1.17	1.8
	TA98+S9	90.80	.92	1.61	1.3
	TA100	90.80	-1.96	3.06	1.1
	TA100+S9	90.80	2.90	3.26	1.2
2-Jun-1982					
	TA98	90.80	.69	1.56	1.2
	TA98+S9	90.80	-.69	1.11	1.2
	TA100	90.80	-.99	6.30	.9
	TA100+S9	90.80	-1.45	4.26	.9

TABLE G-2-20
PROCESS PERFORMANCE
16 MARCH 1982 TO 6 JULY 1982
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % Confidence Interval[1]	Mutagenic Ratio
		Dual Media Filter Effluent (continued)			
15-Jun-1982					
	TA98	94.60	1.01	1.48	1.4
	TA98+S9	94.60	.96	1.78	1.4
	TA100	94.60	-.09	4.23	1.
	TA100+S9	94.60	-.80	4.18	1.1
16-Jun-1982					
	TA98	87.10	.82	1.63	1.4
	TA98+S9	87.10	-.15	1.75	1.3
	TA100	87.10	-.61	5.52	1.1
	TA100+S9	87.10	3.08	5.39	1.2
22-Jun-1982					
	TA98	98.40	1.48	1.0	1.7
	TA98+S9	98.40	.78	1.23	1.4
	TA100	98.40	-2.11	3.21	1.
	TA100+S9	98.40	-.18	3.74	1.2
23-Jun-1982					
	TA98	94.60	-.12	1.46	1.1
	TA98+S9	94.60	-.58	1.68	1.1
	TA100	94.60	.83	3.63	1.2
	TA100+S9	94.60	2.80	3.39	1.1
29-Jun-1982					
	TA98	106.00	1.01	1.03	1.4
	TA98+S9	106.00	.81	1.37	1.4
	TA100	106.00	.60	5.12	1.1
	TA100+S9	106.00	1.40	3.69	1.1

TABLE G-2-20
PROCESS PERFORMANCE
16 MARCH 1982 TO 6 JULY 1982
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		Final Carbon Column Effluent			
16-Mar-1982					
	TA98	115.50	.25	1.13	1.1
	TA98	98.40	-.42	1.29	1.2
	TA98+S9	115.50	-.41	1.30	1.3
	TA98+S9	98.40	2.43	1.15	1.7
	TA100	115.50	-.00	4.44	1.1
	TA100	98.40	8.45	6.22	1.4
	TA100+S9	115.50	1.19	2.85	1.0
	TA100+S9	98.40	.36	4.11	1.0
17-Mar-1982					
	TA98	83.30	1.04	2.18	1.4
	TA98+S9	83.30	.32	1.55	1.0
	TA100	83.30	2.01	3.12	1.1
	TA100+S9	83.30	2.03	4.47	1.1
18-Mar-1982					
	TA98	112.50	-.38	1.29	1.
	TA98+S9	112.50	.44	1.10	1.2
	TA100	112.50	3.16	3.89	1.2
	TA100+S9	112.50	3.52	3.61	1.2
30-Mar-1982					
	TA98	106.00	-.48	1.45	1.0
	TA98+S9	106.00	.75	.87	1.3
	TA100	106.00	-1.96	2.52	1.1
	TA100+S9	106.00	2.60	6.31	1.4
31-Mar-1982					
	TA98	98.40	.46	1.23	1.1
	TA98+S9	98.40	-.05	1.41	1.1
	TA100	98.40	.18	5.36	1.
	TA100+S9	98.40	2.43	6.18	1.2
6-Apr-1982					
	TA98	75.70	.29	1.91	1.2
	TA98+S9	75.70	.41	1.04	1.2
	TA100	75.70	2.53	6.51	1.0
	TA100+S9	75.70	7.12	7.31	1.3
7-Apr-1982					
	TA98	75.70	.39	.90	1.2
	TA98+S9	75.70	.06	2.33	1.3
	TA100	75.70	-2.90	3.74	.9
	TA100+S9	75.70	1.55	5.21	1.1
20-Apr-1982					
	TA98	98.40	.16	1.41	1.0
	TA98+S9	98.40	-.36	.90	1.1
	TA100	98.40	-1.98	4.44	1.0
	TA100+S9	98.40	4.30	4.66	1.3
27-Apr-1982					
	TA98	90.80	.61	1.31	1.1
	TA98+S9	90.80	-.73	1.57	.8
	TA100	90.80	-4.17	2.72	.9
	TA100+S9	90.80	-1.34	3.73	1.0
28-Apr-1982					
	TA98	109.70	N.A.	N.A.	N.A.
	TA98+S9	109.70	N.A.	N.A.	N.A.
	TA100	109.70	N.A.	N.A.	N.A.
	TA100+S9	109.69	N.A.	N.A.	N.A.
4-May-1982					
	TA98	106.00	-.27	1.33	.9
	TA98+S9	106.00	-1.43	.88	.9
	TA100	106.00	3.16	4.16	1.2
	TA100+S9	106.00	.62	3.40	1.2
11-May-1982					
	TA98	60.60	-.17	2.44	1.3
	TA98+S9	60.60	.66	2.61	1.0
	TA100	60.60	N.A.	N.A.	N.A.
	TA100+S9	60.60	N.A.	N.A.	N.A.
12-May-1982					
	TA98	94.60	1.17	1.49	1.7
	TA98+S9	94.60	1.59	1.66	1.6
	TA100	94.60	1.72	3.19	1.1
	TA100+S9	94.60	1.64	3.99	1.1
25-May-1982					
	TA98	109.80	.05	1.07	1.1
	TA98+S9	109.80	-.47	1.90	1.3
	TA100	109.80	-1.66	2.53	1.0
	TA100+S9	109.80	-3.20	3.88	1.

TABLE G-2-20
PROCESS PERFORMANCE
16 MARCH 1982 TO 6 JULY 1982
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		Final Carbon Column Effluent (continued)			
26-May-1982					
	TA98	109.80	-.07	1.03	1.1
	TA98+S9	109.80	-.39	1.26	.9
	TA100	109.80	-2.23	.90	1.
	TA100+S9	109.80	-1.48	2.89	1.0
2-Jun-1982					
	TA98	113.60	.18	.48	1.1
	TA98+S9	113.60	-.14	1.22	1.4
	TA100	113.60	-3.72	3.81	.8
	TA100+S9	113.60	-1.68	3.70	.9
15-Jun-1982					
	TA98	90.80	.98	1.07	1.4
	TA98+S9	90.80	.13	1.32	1.2
	TA100	90.80	-3.70	3.40	1.
	TA100+S9	90.80	.87	2.67	1.1
16-Jun-1982					
	TA98	106.00	.41	.78	1.2
	TA98+S9	106.00	-.06	1.22	1.2
	TA100	106.00	-2.21	3.78	.9
	TA100+S9	106.00	1.72	4.83	1.1
22-Jun-1982					
	TA98	102.20	.57	1.27	1.3
	TA98+S9	102.20	-.78	1.30	1.1
	TA100	102.20	-3.05	4.66	1.0
	TA100+S9	102.20	-2.19	3.46	1.1
23-Jun-1982					
	TA98	106.00	-.16	.75	1.1
	TA98+S9	106.00	-.15	.95	1.2
	TA100	106.00	-1.01	3.30	1.0
	TA100+S9	106.00	-.61	2.54	1.0
29-Jun-1982					
	TA98	109.80	-.31	1.22	1.2
	TA98+S9	109.80	-.24	1.19	1.2
	TA100	109.80	-.56	4.31	1.1
	TA100+S9	109.80	.64	2.67	1.1
		EEWTP Finished Water (See Table H-7 for Results)			

1. Numbers refer to the size of the interval bracketing the corresponding specific activity value; i.e. Specific Activity $\pm$ Confidence Interval.

SECTION 3

PROCESS PERFORMANCE
16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)

OVERVIEW

This appendix provides statistical summary tables for the EEWTP process sites during the main lime phase of operation, Phase IIA. The data summarized here was collected over a seven and one half month period between 16 July 1982 and 1 February 1983.

The data are organized by parameter group, as indicated below:

Process Performance
16 July 1982 to 1 February 1983 (Phase IIA)

All the data reported here are from 24-hour composite samples unless noted otherwise (next to parameter name). In some cases, a negligible number of composite samples were missed, and grab samples taken in their place are included with the data analysis.

TABLE G-3-1
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
PHYSICAL/AESTHETIC PARAMETERS

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Temperature, deg. C [in-situ readings]						
No. of Readings	199					199
Arithmetic Mean	19.7					20.1
Standard Deviation	6.4					6.2
Median Value	20.0					19.7
Minimum Value	8.0					9.0
Maximum Value	29.5					29.8
pH [grab samples]						
No. of Readings	1077	2144 (Before re-carbonation)	1077		1078	1079
Arithmetic Mean	7.2	10.7	7.5		7.2	7.4
Standard Deviation	0.2	0.3	0.3		0.2	0.1
Geometric Mean	7.2	10.7	7.5		7.2	7.4
Spread Factor	1.03	1.01	1.04		1.02	1.00
Median Value	7.2	10.8	7.5		7.2	7.4
Minimum Value	3.9	7.7	6.6		6.7	6.9
Maximum Value	8.0	11.5	9.0		7.7	7.8
Dissolved Oxygen [grab samples] (MDL=0.15 mg/l)						
No. of Readings	179	179 (After re-carbonation)	179	179	177	178
Arithmetic Mean	8.1	8.7	7.8	5.9	4.8	8.5
Standard Deviation	2.0	1.5	1.4	1.9	2.1	2.5
Geometric Mean	7.9	8.6	7.6	5.6	4.2	7.7
Spread Factor	1.29	1.19	1.20	1.42	1.70	1.75
Median Value	8.5	8.7	7.9	6.0	4.9	9.2
Minimum Value	4.3	5.9	4.8	2.4	0.6	0.6
Maximum Value	12.1	12.3	11.2	9.9	9.0	11.4
Turbidity [grab samples] (MDL= 0.05 NTU)						
No. of Samples	1080	1080 (After re-carbonation)	2011		1080	1079
No. Above MDL	1080	1080	2011		1080	1076
Arithmetic Mean	9.62	2.81	0.13		0.08	0.07
Standard Deviation	4.93	2.75	0.33		0.37	0.04
Geometric Mean	8.72	2.27	0.11		0.06	0.06
Spread Factor	1.55	1.83	1.64		1.50	1.47
Median Value	9.00	2.30	0.10		0.05	0.05
90% Less Than	15.00	4.70	0.20		0.10	0.10
Total Suspended Solids (TSS) (MDL= 3.6 mg/l)						
No. of Samples	24	21 (After re-carbonation)	23		23	
No. Above MDL	22	15	9		10	
Arithmetic Mean	12.31	5.24	2.53		2.33	
Standard Deviation	6.63	3.34	1.78		2.08	
Geometric Mean	10.65	4.82	3.05		3.17	
Spread Factor	1.81	1.66	1.42		1.35	
Median Value	11.0	4.6	ND		ND	
90% Less Than	23.6	7.8	3.6		3.6	

TABLE G-3-1
PROCESS PERFORMANCE — 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
PHYSICAL/AESTHETIC PARAMETERS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Apparent Color (MDL= 3 color units)						
No. of Samples	22		22			21
No. Above MDL	22		22			21
Arithmetic Mean	47.7		12.6			11.4
Standard Deviation	6.9		3.2			4.1
Geometric Mean	47.3		12.2			10.5
Spread Factor	1.15		1.33			1.55
Median Value	45		15			15
90% Less Than	55		15			15
MBAS (MDL= 0.03 mg/l)						
No. of Samples	6		6			6
No. Above MDL	6		6			3
Arithmetic Mean	0.078		0.068			0.022
Standard Deviation	0.024		0.019			0.008
Geometric Mean	0.075		0.066			Not
Spread Factor	1.34		1.28			Calculated
Median Value	0.06		0.06			ND
90% Less Than	0.10		0.10			0.03
Odor (MDL= 1 TON)						
No. of Samples					47	46
No. Above MDL					47	44
Arithmetic Mean					6.7	13.4
Standard Deviation					11.2	22.1
Geometric Mean					3.5	5.2
Spread Factor					2.91	4.05
Median Value					2	4
90% Less Than					17	40
Free Chlorine [grab samples] (MDL= 0.1 mg/l-Cl)						
No. of Samples						1150
No. Above MDL						944
Arithmetic Mean						0.20
Standard Deviation						0.42
Geometric Mean						0.12
Spread Factor						2.15
Median Value						0.1
90% Less Than						0.3

TABLE G-3-1
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
PHYSICAL/AESTHETIC PARAMETERS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Chlorine [grab samples] (MDL= 0.1 mg/l-Cl)						
No. of Samples						1195
No. Above MDL						1194
Arithmetic Mean						2.98
Standard Deviation						0.42
Geometric Mean						2.92
Spread Factor						1.26
Median Value						3.1
90% Less Than						3.3

TABLE G-3-2 (A)
PROCESS PERFORMANCE
16 JULY 1982 TO 1 FEBRUARY 1983
ASBESTOS FIBER CONCENTRATION

CHRYSOTILE FIBERS

	EEWTP Blended Influent	EEWTP Finished Water
Summary Data:		
Total Number of Samples	26	24
Total Volume Filtered, Liters (VT)	0.326	1.214
Equivalent Volume Examined, Liters (V)	0.0000475	0.0001775
Percent Filter Area Examined (V/VT * 100)	0.01454	0.01462
Chrysotile Fiber Results:		
Total Fibers Counted (N)	138	2
Max. Concentration, MFL	17.915	0.263
Min. Concentration, MFL	N.D.	N.D.
Median Concentration, MFL	1.283	N.D.
90 Percentile Concentration, MFL	7.426	N.D.
Average Concentration (N/V), MFL	2.907	0.011
Minimum Detection Limits		
Highest, MFL	1.629	0.137
Lowest, MFL	0.370	0.129

AMPHIBOLE FIBERS

	EEWTP Blended Influent	EEWTP Finished Water
Summary Data:		
Total Number of Samples	0	24
Total Volume Filtered, Liters (VT)	0	1.214
Equivalent Volume Examined, Liters (V)	0	0.0001775
Percent Filter Area Examined (V/VT * 100)	0	0.01462
Amphibole Fiber Results:		
Total Fibers Counted (N)	N.A.	0
Max. Concentration, MFL	N.A.	N.D.
Min. Concentration, MFL	N.A.	N.D.
Median Concentration, MFL	N.A.	N.D.
90 Percentile Concentration, MFL	N.A.	N.D.
Average Concentration (N/V), MFL	N.A.	N.D.
Minimum Detection Limits		
Highest, MFL	N.A.	0.137
Lowest, MFL	N.A.	0.129

TABLE G-3-2 (B)
PROCESS PERFORMANCE
16 JULY 1982 TO 1 FEBRUARY 1983
ASBESTOS FIBER CHARACTERIZATION

	EEWTP Blend Tank	EEWTP Finished Water
Chrysotile Fibers:		
Number of Fibers Examined *	119	0
Length Distribution,		
Fibers/Samples		
0.0 - 0.49 um	19/9	0/0
0.50 - 0.9 um	51/12	0/0
1.0 - 1.4 um	23/10	0/0
1.5 - 1.9 um	6/4	0/0
2.0 - 2.4 um	6/6	0/0
> 2.5 um	14/8	0/0
Width Distribution,		
Fibers/Samples		
0.00 - 0.04 um	5/4	0/0
0.05 - 0.09 um	93/12	0/0
0.10 - 0.14 um	12/7	0/0
0.15 - 0.19 um	4/4	0/0
0.20 - 0.24 um	2/2	0/0
> 2.5 um	3/3	0/0
Aspect Ratio Distribution,		
Fibers/Samples		
0.0 - 9.0	38/11	0/0
10.0 - 19.9	51/12	0/0
20.0 - 29.9	15/7	0/0
30.0 - 39.9	4/4	0/0
40.0 - 49.9	1/1	0/0
> 50.0	10/7	0/0
Amphibole Fibers:		
Number of Fibers Examined *	0	0
Length Distribution,		
Fibers/Samples		
0.0 - 0.49 um	0/0	0/0
0.50 - 0.9 um	0/0	0/0
1.0 - 1.4 um	0/0	0/0
1.5 - 1.9 um	0/0	0/0
2.0 - 2.4 um	0/0	0/0
> 2.5 um	0/0	0/0
Width Distribution,		
Fibers/Samples		
0.00 - 0.04 um	0/0	0/0
0.05 - 0.09 um	0/0	0/0
0.10 - 0.14 um	0/0	0/0
0.15 - 0.19 um	0/0	0/0
0.20 - 0.24 um	0/0	0/0
> 2.5 um	0/0	0/0
Aspect Ratio Distribution,		
Fibers/Samples		
0.0 - 9.0	0/0	0/0
10.0 - 19.9	0/0	0/0
20.0 - 29.9	0/0	0/0
30.0 - 39.9	0/0	0/0
40.0 - 49.9	0/0	0/0
> 50.0	0/0	0/0

* Only those fibers from samples with 5 or more fibers were used.

TABLE G-3-3
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MAJOR CATIONS, ANIONS, AND NUTRIENTS

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Dissolved Solids (TDS): by addition (MDL= 1 mg/l)					
No. of Samples	52		54		53
No. Above MDL	52		54		53
Arithmetic Mean	265.3		297.2		304.2
Standard Deviation	28.1		32.5		42.6
Geometric Mean	263.8		295.3		301.5
Spread Factor	1.11		1.12		1.14
Median Value	260		294		303
90% Less Than	300		329		347
Electroconductivity [grab samples] (MDL= 0.1 umho/cm)					
No. of Samples	945		55		53
No. Above MDL	945		55		53
Arithmetic Mean	506.0		573.6		581.0
Standard Deviation	59.0		50.0		63.3
Geometric Mean	502.4		571.5		577.7
Spread Factor	1.12		1.09		1.11
Median Value	520.0		570.0		580.0
90% Less Than	580.0		610.0		635.0
Calcium (MDL= 0.2 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	55	55	54	55	55
Arithmetic Mean	51.38	85.40	70.24	71.55	70.75
Standard Deviation	5.63	39.91	15.86	20.03	19.69
Geometric Mean	51.07	79.06	68.51	69.27	68.67
Spread Factor	1.12	1.45	1.25	1.28	1.27
Median Value	51.0	74.3	65.4	67.1	65.9
90% Less Than	59.2	135.0	90.0	91.8	87.4
Hardness: by addition (Ca+Mg, as CaCO3) (MDL= 1.0 mg/l-CaCO3)					
No. of Samples	55	54	54	55	55
No. Above MDL	55	54	54	55	55
Arithmetic Mean	165.7	233.5	195.2	198.5	197.2
Standard Deviation	17.8	95.5	31.9	43.2	42.7
Geometric Mean	164.8	220.0	192.6	194.7	193.7
Spread Factor	1.11	1.38	1.18	1.21	1.20
Median Value	165	210	188	189	190
90% Less Than	191	346	233	239	227
Magnesium (MDL= 0.1 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	55	55	54	55	55
Arithmetic Mean	9.09	4.93	4.80	4.80	4.98
Standard Deviation	1.16	2.41	2.39	2.39	2.39
Geometric Mean	9.01	4.21	4.05	4.08	4.26
Spread Factor	1.14	1.84	1.91	1.88	1.86
Median Value	9.3	5.4	5.2	5.4	5.4
90% Less Than	10.5	8.1	7.7	8.3	8.2

TABLE G-3-3
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Potassium					
(MDL= 0.3 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	55	55	54	55	55
Arithmetic Mean	6.29	6.17	6.16	6.19	6.25
Standard Deviation	0.60	0.68	0.67	0.66	0.68
Geometric Mean	6.26	6.13	6.12	6.15	6.21
Spread Factor	1.10	1.13	1.13	1.12	1.13
Median Value	6.2	6.3	6.2	6.3	6.3
90% Less Than	7.0	6.9	6.9	6.9	7.0
Sodium					
(MDL= 0.1 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	55	55	54	55	55
Arithmetic Mean	31.12	32.08	31.29	31.44	31.87
Standard Deviation	4.47	5.07	4.25	5.17	4.28
Geometric Mean	30.77	31.68	31.00	30.95	31.57
Spread Factor	1.17	1.17	1.15	1.21	1.15
Median Value	31.5	33.3	32.4	32.9	33.3
90% Less Than	36.0	37.0	36.0	36.4	36.2
Alkalinity					
(MDL= 2.7 mg/l-$CaCO_3$)					
No. of Samples	52		55		53
No. Above MDL	52		55		53
Arithmetic Mean	72.56		103.20		101.32
Standard Deviation	10.90		31.62		39.48
Geometric Mean	71.70		98.95		96.09
Spread Factor	1.17		1.34		1.36
Median Value	71.0		100.0		96.0
90% Less Than	85.0		137.0		131.0
Bromide					
(MDL= 0.003 mg/l)					
No. of Samples	52		55		53
No. Above MDL	51		53		49
Arithmetic Mean	0.0407		0.0423		0.0392
Standard Deviation	0.0283		0.0296		0.0440
Geometric Mean	0.0312		0.0307		0.0224
Spread Factor	2.22		2.48		3.22
Median Value	0.036		0.038		0.031
90% Less Than	0.075		0.083		0.080
Chloride					
(MDL= 0.1 mg/l)					
No. of Samples	52		55		53
No. Above MDL	52		55		53
Arithmetic Mean	56.38		56.62		61.26
Standard Deviation	6.14		7.49		7.33
Geometric Mean	56.05		56.06		60.78
Spread Factor	1.12		1.16		1.14
Median Value	56.0		58.0		63.0
90% Less Than	63.0		65.0		68.0

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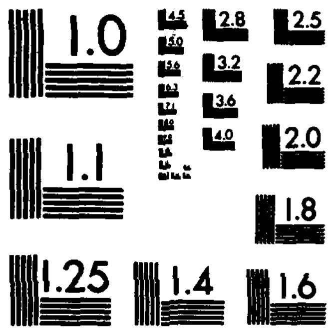

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE G-3-3
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Cyanide, Total (MDL= 0.005 mg/l)					
No. of Samples	54				53
No. Above MDL	18				8
Arithmetic Mean	0.0046				0.0034
Standard Deviation	0.0035				0.0023
Geometric Mean	0.0037				0.0021
Spread Factor	2.09				2.34
Median Value	ND				ND
90% Less Than	0.010				0.006
Fluoride (MDL= 0.10 mg/l)					
No. of Samples	52		55		53
No. Above MDL	52		55		53
Arithmetic Mean	0.52		0.46		0.48
Standard Deviation	0.07		0.09		0.11
Geometric Mean	0.52		0.45		0.47
Spread Factor	1.15		1.24		1.26
Median Value	0.5		0.4		0.5
90% Less Than	0.6		0.6		0.6
Nitrogen, Nitrite + Nitrate (MDL= 0.02 mg/l-N)					
No. of Samples	52		55	55	53
No. Above MDL	52		55	55	53
Arithmetic Mean	7.82		7.75	7.27	7.94
Standard Deviation	1.28		1.58	1.73	1.63
Geometric Mean	7.72		7.52	7.01	7.71
Spread Factor	1.18		1.32	1.34	1.31
Median Value	7.9		8.0	7.5	8.3
90% Less Than	9.3		9.5	9.3	9.6
Nitrogen, Ammonia (MDL= 0.02 mg/l-N)					
No. of Samples	52		55	55	53
No. Above MDL	49		27	21	48
Arithmetic Mean	0.242		0.094	0.053	0.731
Standard Deviation	0.216		0.128	0.080	0.413
Geometric Mean	0.177		0.025	0.013	0.491
Spread Factor	2.36		7.31	6.74	3.60
Median Value	0.20		ND	ND	0.80
90% Less Than	0.40		0.26	0.10	1.20
Nitrogen, Total Kjeldahl (MDL= 0.2 mg/l-N)					
No. of Samples	52		55	55	53
No. Above MDL	52		55	46	52
Arithmetic Mean	1.15		0.85	0.60	1.06
Standard Deviation	0.53		0.50	0.50	0.62
Geometric Mean	1.05		0.73	0.45	0.89
Spread Factor	1.55		1.72	2.23	1.88
Median Value	1.0		0.7	0.4	1.0
90% Less Than	1.6		1.4	1.1	1.8

TABLE G-3-3
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Ortho Phosphate (MDL= 0.01 mg/l-P)					
No. of Samples	52		55	55	53
No. Above MDL	51		17	8	9
Arithmetic Mean	0.252		0.029	0.016	0.016
Standard Deviation	0.087		0.079	0.033	0.041
Geometric Mean	0.230		0.004		0.001
Spread Factor	1.74		9.80		14.54
Median Value	0.25		ND	ND	ND
90% Less Than	0.37		0.05	0.04	0.04
Silica (MDL= 0.2 mg/l)					
No. of Samples	52		55		53
No. Above MDL	52		55		53
Arithmetic Mean	5.59		5.00		4.97
Standard Deviation	1.18		1.15		1.41
Geometric Mean	5.47		4.86		4.80
Spread Factor	1.23		1.29		1.31
Median Value	5.3		4.8		4.7
90% Less Than	7.2		6.6		6.5
Sulfate (MDL= 0.6 mg/l)					
No. of Samples	52		55		53
No. Above MDL	52		55		53
Arithmetic Mean	54.56		54.95		55.62
Standard Deviation	9.85		9.66		10.65
Geometric Mean	53.69		54.12		54.61
Spread Factor	1.20		1.19		1.21
Median Value	54.0		55.8		55.4
90% Less Than	67.0		69.0		71.0

TABLE G-3-4
PROCESS PERFORMANCE — 16 JULY 1982 TO 1 FEBRUARY 1982 (PHASE IIA)
TRACE METALS

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Aluminum (MDL= 0.003 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	55	51	43	46	45
Arithmetic Mean	0.3827	0.0675	0.0209	0.0221	0.0203
Standard Deviation	0.6564	0.1716	0.0379	0.0190	0.0198
Geometric Mean	0.2173	0.0361	0.0113	0.0144	0.0128
Spread Factor	2.68	2.84	3.15	2.94	3.02
Median Value	0.220	0.040	0.010	0.020	0.020
90% Less Than	0.760	0.090	0.030	0.050	0.040
Arsenic (MDL= 0.0002 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	48	49	49	48	48
Arithmetic Mean	0.00071	0.00056	0.00046	0.00047	0.00044
Standard Deviation	0.00044	0.00036	0.00033	0.00036	0.00030
Geometric Mean	0.00058	0.00046	0.00039	0.00039	0.00037
Spread Factor	2.02	1.90	1.77	1.91	1.82
Median Value	0.0007	0.0005	0.0003	0.0004	0.0003
90% Less Than	0.0013	0.0012	0.0010	0.0009	0.0009
Barium (MDL= 0.002 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	55	53	53	54	55
Arithmetic Mean	0.0319	0.0214	0.0179	0.0172	0.0172
Standard Deviation	0.0108	0.0083	0.0058	0.0056	0.0048
Geometric Mean	0.0303	0.0194	0.0168	0.0161	0.0166
Spread Factor	1.38	1.72	1.51	1.51	1.31
Median Value	0.030	0.020	0.017	0.016	0.016
90% Less Than	0.044	0.031	0.025	0.024	0.024
Boron (MDL= 0.0040 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	55	53	53	53	54
Arithmetic Mean	0.05339	0.04791	0.04669	0.04485	0.04247
Standard Deviation	0.01229	0.01561	0.01401	0.01627	0.01591
Geometric Mean	0.05198	0.04331	0.04356	0.04010	0.03877
Spread Factor	1.26	1.78	1.57	1.80	1.63
Median Value	0.0520	0.0513	0.0470	0.0461	0.0431
90% Less Than	0.0690	0.0630	0.0603	0.0637	0.0636
Cadmium: furnace AAS (MDL= 0.0002 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	4	2	1	2	2
Arithmetic Mean	0.00012	0.00019	0.00011	0.00011	0.00011
Standard Deviation	0.00008	0.00063	0.00004	0.00004	0.00003
Median Value	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND

TABLE G-3-4
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1982 (PHASE IIA)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chromium: furnace AAS (MDL= 0.0002 mg/l)					
No. of Samples	54	54	53	54	55
No. Above MDL	52	52	49	50	53
Arithmetic Mean	0.00559	0.00375	0.00250	0.00200	0.00178
Standard Deviation	0.00467	0.00296	0.00362	0.00205	0.00165
Geometric Mean	0.00407	0.00271	0.00148	0.00123	0.00123
Spread Factor	2.48	2.53	2.83	2.99	2.50
Median Value	0.0042	0.0030	0.0016	0.0016	0.0012
90% Less Than	0.0098	0.0062	0.0045	0.0041	0.0038
Copper: flame AAS (MDL= 0.0012 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	54	45	44	20	22
Arithmetic Mean	0.00809	0.00281	0.00310	0.00129	0.00145
Standard Deviation	0.00467	0.00177	0.00186	0.00113	0.00139
Geometric Mean	0.00707	0.00237	0.00261	0.00091	0.00096
Spread Factor	1.70	1.90	1.94	2.41	2.55
Median Value	0.0078	0.0026	0.0030	ND	ND
90% Less Than	0.0130	0.0048	0.0059	0.0030	0.0031
Iron (MDL= 0.003 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	55	53	42	34	38
Arithmetic Mean	1.1304	0.2171	0.0220	0.0352	0.0158
Standard Deviation	1.0219	0.1600	0.0356	0.1262	0.0209
Geometric Mean	0.7903	0.1447	0.0098	0.0050	0.0071
Spread Factor	2.46	3.29	3.79	6.68	4.05
Median Value	0.840	0.190	0.011	0.004	0.007
90% Less Than	2.300	0.420	0.059	0.043	0.038
Lead (MDL= 0.0003 mg/l)					
No. of Samples	55	55	54	54	54
No. Above MDL	53	30	12	9	13
Arithmetic Mean	0.00315	0.00052	0.00027	0.00031	0.00031
Standard Deviation	0.00345	0.00049	0.00026	0.00047	0.00036
Geometric Mean	0.00210	0.00035	0.00013	0.00005	0.00012
Spread Factor	2.46	2.59	3.12	6.60	3.71
Median Value	0.0022	0.0003	ND	ND	ND
90% Less Than	0.0066	0.0012	0.0006	0.0008	0.0007
Lithium: flame AAS (MDL= 0.0004 mg/l)					
No. of Samples	54	55	54	55	55
No. Above MDL	54	55	54	55	55
Arithmetic Mean	0.00649	0.00566	0.00679	0.00574	0.00569
Standard Deviation	0.00304	0.00223	0.00894	0.00129	0.00098
Geometric Mean	0.00611	0.00538	0.00568	0.00562	0.00561
Spread Factor	1.36	1.36	1.54	1.22	1.18
Median Value	0.0059	0.0056	0.0056	0.0057	0.0058
90% Less Than	0.0076	0.0068	0.0070	0.0069	0.0069

TABLE G-3-4
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1982 (PHASE IIA)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Manganese (MDL= 0.0010 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	55	53	48	17	17
Arithmetic Mean	0.15055	0.01936	0.00569	0.00238	0.00208
Standard Deviation	0.12859	0.02035	0.01206	0.00665	0.00366
Geometric Mean	0.11041	0.01334	0.00296	0.00037	0.00039
Spread Factor	2.32	2.50	2.73	6.88	7.12
Median Value	0.1120	0.0127	0.0026	ND	ND
90% Less Than	0.3400	0.0312	0.0108	0.0061	0.0081
Mercury (MDL= 0.00027 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	6	8	4	7	10
Arithmetic Mean	0.00021	0.00024	0.00016	0.00017	0.00022
Standard Deviation	0.00029	0.00039	0.00011	0.00009	0.00022
Geometric Mean					0.00009
Spread Factor					3.32
Median Value	ND	ND	ND	ND	ND
90% Less Than	0.0003	0.0004	ND	0.0003	0.0004
Nickel (MDL= 0.0010 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	49	40	29	35	30
Arithmetic Mean	0.00507	0.00326	0.00202	0.00323	0.00166
Standard Deviation	0.00331	0.00376	0.00213	0.00536	0.00136
Geometric Mean	0.00406	0.00213	0.00121	0.00158	0.00121
Spread Factor	2.12	2.66	2.97	3.25	2.40
Median Value	0.0047	0.0026	0.0013	0.0019	0.0013
90% Less Than	0.0097	0.0055	0.0041	0.0040	0.0039
Selenium (MDL= 0.0002 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	31	42	43	43	39
Arithmetic Mean	0.00057	0.00078	0.00091	0.00082	0.00072
Standard Deviation	0.00064	0.00067	0.00072	0.00059	0.00058
Geometric Mean	0.00028	0.00051	0.00061	0.00057	0.00046
Spread Factor	3.78	2.85	2.79	2.68	2.97
Median Value	0.0003	0.0006	0.0008	0.0008	0.0006
90% Less Than	0.0014	0.0018	0.0020	0.0016	0.0015
Silver: furnace AAS (MDL= 0.0002 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	29	27	4	4	2
Arithmetic Mean	0.00028	0.00036	0.00011	0.00012	0.00010
Standard Deviation	0.00028	0.00044	0.00005	0.00008	0.00002
Geometric Mean	0.00020	0.00020			
Spread Factor	2.30	3.07			
Median Value	0.0002	ND	ND	ND	ND
90% Less Than	0.0006	0.0008	ND	ND	ND

TABLE G-3-4
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1982 (PHASE IIA)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Titanium (MDL= 0.0020 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	51	21	2	3	2
Arithmetic Mean	0.01380	0.00366	0.00107	0.00120	0.00106
Standard Deviation	0.01151	0.00458	0.00037	0.00088	0.00029
Geometric Mean	0.00962	0.00141			
Spread Factor	2.49	4.45			
Median Value	0.0106	ND	ND	ND	ND
90% Less Than	0.0327	0.0089	ND	ND	ND
Vanadium (MDL= 0.0020 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	51	51	40	41	38
Arithmetic Mean	0.00519	0.00475	0.00272	0.00321	0.00277
Standard Deviation	0.00326	0.00206	0.00128	0.00259	0.00157
Geometric Mean	0.00459	0.00438	0.00270	0.00284	0.00266
Spread Factor	1.65	1.57	1.46	1.71	1.58
Median Value	0.0046	0.0044	0.0028	0.0031	0.0029
90% Less Than	0.0086	0.0077	0.0041	0.0041	0.0043
Zinc: flame AAS (MDL= 0.0012 mg/l)					
No. of Samples	55	55	54	55	55
No. Above MDL	55	45	41	44	55
Arithmetic Mean	0.01787	0.00381	0.00303	0.00302	0.01000
Standard Deviation	0.01452	0.00287	0.00196	0.00266	0.00682
Geometric Mean	0.01540	0.00286	0.00247	0.00228	0.00830
Spread Factor	1.63	2.30	2.07	2.17	1.85
Median Value	0.0151	0.0033	0.0029	0.0023	0.0087
90% Less Than	0.0250	0.0075	0.0054	0.0059	0.0180

TABLE G-3-5
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
RADIOLOGICAL PARAMETERS

	Blended Influent	EEWTP Finished Water
Gross Alpha (MDL= 0.1 pCi/l)		
No. of Samples	12	12
No. Above MDL	1	0
Arithmetic Mean	0.13	ND
Standard Deviation	0.27	
Median Value	ND	ND
90% Less Than	ND	ND
Gross Alpha 2s Error (MDL= 0.1 pCi/l)		
No. of Samples	12	12
No. Above MDL	12	12
Arithmetic Mean	0.55	0.41
Standard Deviation	0.16	0.20
Geometric Mean	0.52	0.35
Spread Factor	1.41	1.86
Median Value	0.5	0.4
90% Less Than	0.7	0.6
Gross Beta (MDL= 0.1 pCi/l)		
No. of Samples	12	12
No. Above MDL	12	12
Arithmetic Mean	6.62	5.68
Standard Deviation	2.13	2.05
Geometric Mean	6.25	5.27
Spread Factor	1.42	1.52
Median Value	5.9	5.9
90% Less Than	9.0	7.6
Gross Beta 2s Error (MDL= 0.1 pCi/l)		
No. of Samples	12	12
No. Above MDL	12	12
Arithmetic Mean	1.26	1.20
Standard Deviation	0.21	0.22
Geometric Mean	1.24	1.18
Spread Factor	1.19	1.22
Median Value	1.2	1.2
90% Less Than	1.5	1.4
Strontium-90 (MDL= 0.2 pCi/l)		
No. of Samples	7	1
No. Above MDL	5	1
Arithmetic Mean	0.56	0.90
Standard Deviation	0.42	
Geometric Mean	0.42	0.90
Spread Factor	2.36	1.00
Median Value	0.5	0.9
90% Less Than	1.3	0.9

TABLE G-3-5
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
RADIOLOGICAL PARAMETERS
(Continued)

	Blended Influent	EEWTP Finished Water
Strontium-90 2s error (MDL= 0.2 pCi/l)		
No. of Samples	7	1
No. Above MDL	7	1
Arithmetic Mean	0.33	0.30
Standard Deviation	0.05	
Geometric Mean	0.33	0.30
Spread Factor	1.14	1.00
Median Value	0.3	0.3
90% Less Than	0.4	0.3
Tritium (Radiological) (MDL=1000 pCi/l)		
No. of Samples	5	6
No. Above MDL	0	0
Arithmetic Mean	ND	ND
Median Value	ND	ND
90% Less Than	ND	ND

TABLE G-3-6
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MICROBIOLOGICAL PARAMETERS

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	Ozonation Effluent	EEWTP Finished Water
Total Coliform (confirmed): 1000,100,10 ml volumes [grab samples] (MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)						
No. of Samples					93	119
No. of Positives					24	11
No. of TNTC					4	0
Geometric Mean						
Spread Factor					0.0013	
					37.82	
Median Value					ND	ND
90% Less Than					0.050	ND
Maximum Value					>UQL	0.080
Total Coliform (confirmed): 100,10,1 ml volumes [grab samples] (MDL=0.18 MPN/100 ml;UQL=240 MPN/100 ml)						
No. of Samples			27	122		
No. of Positives			27	121		
No. of TNTC			5	2		
Geometric Mean			62.597	3.771		
Spread Factor			3.07	4.92		
Median Value			54.00	3.30		
90% Less Than			>UQL	35.00		
Maximum Value			>UQL	>UQL		
Total Coliform (confirmed): 10,1,-1 ml volumes [grab samples] (MDL=1.8 MPN/100 ml;UQL=2400 MPN/100 ml)						
No. of Samples		28				
No. of Positives		27				
No. of TNTC		4				
Geometric Mean		186.06				
Spread Factor		8.20				
Median Value		240.0				
90% Less Than		>UQL				
Maximum Value		>UQL				
Total Coliform (confirmed): 0.1,0.01,0.001 ml volumes [grab samples] (MDL=180 MPN/100 ml;UQL=240000 MPN/100 m)						
No. of Samples	36					
No. of Positives	36					
No. of TNTC	1					
Geometric Mean	28990.2					
Spread Factor	2.69					
Median Value	24000					
90% Less Than	160000					
Maximum Value	>UQL					
Total Coliform (completed): 1000,100,10 ml volumes [grab samples] (MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)						
No. of Samples					91	102
No. of Positives					19	9
No. of TNTC					2	0
Geometric Mean					0.0012	
Spread Factor					20.98	
Median Value					ND	ND
90% Less Than					0.020	ND
Maximum Value					>UQL	0.080

TABLE G-3-6
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MICROBIOLOGICAL PARAMETERS
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	Ozonation Effluent	EEWTP Finished Water
Fecal Coliform (confirmed): 1000,100,10 ml volumes [grab samples]						
(MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)						
No. of Samples					90	114
No. of Positives					8	1
No. of TNTC					2	0
Median Value					ND	ND
90% Less Than					ND	ND
Maximum Value					>UQL	0.020
Fecal Coliform (confirmed): 100,10,1 ml volumes [grab samples]						
(MDL=0.18 MPN/100 ml;UQL=240 MPN/100 ml)						
No. of Samples			25	110		
No. of Positives			22	85		
No. of TNTC			0	1		
Geometric Mean			11.032	0.598		
Spread Factor			10.74	7.23		
Median Value			24.00	0.50		
90% Less Than			92.00	7.90		
Maximum Value			160.00	>UQL		
Fecal Coliform (confirmed): 10,1,0.1 ml volumes [grab samples]						
(MDL=1.8 MPN/100 ml;UQL=2400 MPN/100 ml)						
No. of Samples		25				
No. of Positives		21				
No. of TNTC		0				
Geometric Mean		42.03				
Spread Factor		11.14				
Median Value		49.0				
90% Less Than		540.0				
Maximum Value		920.0				
Fecal Coliform (confirmed): 0.1,0.01,0.001 ml volumes [grab samples]						
(MDL=180 MPN/100 ml;UQL=240000 MPN/100 m)						
No. of Samples	31					
No. of Positives	31					
No. of TNTC	0					
Geometric Mean	7084.5					
Spread Factor	2.87					
Median Value	7000					
90% Less Than	24000					
Maximum Value	92000					
Standard Plate Count: 1 ml volume [grab samples]						
(MDL=1.0 colonies/ml)						
No. of Samples			27	116	86	112
No. of Positives			27	115	30	29
Geometric Mean			496.5	26.5	0.5	0.4
Spread Factor			3.38	4.33	6.30	4.29
Median Value			525	25	ND	ND
90% Less Than			2400	143	8	2
Maximum Value			5400	3840	30	29

TABLE G-3-6
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MICROBIOLOGICAL PARAMETERS
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Final Carbon Column Effluent	Ozonation Effluent	EEWTP Finished Water
Standard Plate Count: 0.1 ml volume [grab samples] (MDL= 10.0 colonies/m)						
No. of Samples		26				
No. of Positives		26				
Geometric Mean		1028.5				
Spread Factor		2.44				
Median Value		950				
90% Less Than		3950				
Maximum Value		12550				
Standard Plate Count: 0.01 ml volume [grab samples] (MDL=100 colonies/ml)						
No. of Samples	34					
No. of Positives	34					
Geometric Mean	13547.9					
Spread Factor	2.04					
Median Value	15000					
90% Less Than	28500					
Maximum Value	58000					
Salmonella: 1000 ml volume [grab samples] (MDL=0.022 MPN/100 ml;UQL= 0.16 MPN/100 ml)						
No. of Samples						7
No. of Positives						0
No. of TNTC						0
Median Value						ND
90% Less Than						ND
Maximum Value						ND
Salmonella: 100 ml volume [grab samples] (MDL=0.22 MPN/100 ml;UQL= 1.6 MPN/100 ml)						
No. of Samples	7					
No. of Positives	3					
No. of TNTC	0					
Geometric Mean	0.188					
Spread Factor	1.70					
Median Value	ND					
90% Less Than	0.51					
Maximum Value	0.51					

TABLE G-3-7 (A)
PROCESS PERFORMANCE
16 JULY 1982 TO 2 FEBRUARY 1983
VIRUS ASSAY

EEWTP Blended Influent (See Table F-7 for Results)
EEWTP Finished Water (See Table H-7 for Results)

TABLE G-3-8
PROCESS PERFORMANCE
16 JULY 1982 TO 1 FEBRUARY 1983
PARASITES

EEWTP Blend Tank

Samples Assayed:	7
Total Volume Filtered (Gallons):	1029.5
Total Equivalent Volume (Gallons):	512.3
Samples with Unknown Volume:	0
Samples with Unknown Equiv. Volume:	0

Parasite Name	Number Observed
Giardia	1
Entamoeba histolytica	1
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

EEWTP Finished Water

Samples Assayed:	7
Total Volume Filtered (Gallons):	2262.0
Total Equivalent Volume (Gallons):	1063.5
Samples with Unknown Volume:	0
Samples with Unknown Equiv. Volume:	0

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

TABLE G-3-9
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
ORGANIC SURROGATE PARAMETERS -- TOC AND TOX

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Organic Carbon: DC80 (MDL=0.06 mg/l-C)						
No. of Samples	109	108	106	95	105	97
No. Above MDL	109	108	106	95	105	97
Arithmetic Mean	4.60	3.04	2.79	1.42	0.78	0.75
Standard Deviation	1.28	0.50	0.40	0.66	0.77	0.33
Geometric Mean	4.46	3.00	2.75	1.23	0.64	0.67
Spread Factor	1.26	1.19	1.22	1.78	1.79	1.59
Median Value	4.2	3.0	2.7	1.5	0.6	0.7
90% Less Than	6.2	3.6	3.2	2.2	1.2	1.2
Total Organic Carbon: DC80 [grab samples] (MDL=0.06 mg/l-C)						
No. of Samples	193	193	192	192	192	191
No. Above MDL	193	193	192	192	192	191
Arithmetic Mean	4.39	3.34	3.13	1.85	1.22	1.31
Standard Deviation	0.46	0.47	0.40	0.70	0.40	0.42
Geometric Mean	4.37	3.31	3.10	1.68	1.15	1.24
Spread Factor	1.10	1.15	1.14	1.63	1.44	1.41
Median Value	4.3	3.3	3.1	2.0	1.2	1.3
90% Less Than	4.8	3.9	3.7	2.6	1.7	1.9
Total Organic Halogen (MDL=3.9 ug/l-Cl)						
No. of Samples	107	107	106	95	108	97
No. Above MDL	107	107	106	91	89	94
Arithmetic Mean	119.35	85.51	79.43	49.21	23.66	36.37
Standard Deviation	29.36	23.60	23.13	26.83	17.30	27.34
Geometric Mean	115.83	82.17	75.90	39.12	16.07	27.28
Spread Factor	1.28	1.34	1.36	2.25	2.85	2.24
Median Value	115.0	85.0	80.0	50.0	20.0	30.0
90% Less Than	160.0	120.0	110.0	80.0	45.0	75.0

TABLE G-3-10
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chloroform: LLE ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	108	108	105	95	107	99
No. Detected	108	108	105	91	87	96
No. Above MDL	108	108	105	83	65	81
Arithmetic Mean	1.88	2.20	2.15	1.77	0.93	1.23
Standard Deviation	0.66	0.54	0.54	0.94	0.89	1.04
Geometric Mean	1.81	2.14	2.08	1.39	0.48	0.77
Spread Factor	1.30	1.28	1.32	2.35	3.73	2.90
Median Value	1.8	2.1	2.1	1.9	0.5	0.8
90% Less Than	2.4	3.0	2.9	2.7	2.3	2.8
Chloroform: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	15		13		13	13
No. Detected	15		12		6	8
No. Above MDL	15		12		6	8
Arithmetic Mean	1.70		1.85		0.71	1.13
Standard Deviation	0.67		0.73		0.87	1.44
Geometric Mean	1.61		1.61		0.21	0.37
Spread Factor	1.35		2.01		6.90	5.85
Median Value	1.5		1.7		ND	0.3
90% Less Than	2.2		2.8		2.1	3.4
Maximum Value	3.8		3.0		2.4	4.0
Bromodichloromethane: LLE ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	108	108	105	95	107	99
No. Detected	108	108	105	80	29	96
No. Above MDL	91	86	80	43	2	34
Arithmetic Mean	0.42	0.35	0.33	0.26	0.09	0.35
Standard Deviation	0.22	0.11	0.11	0.30	0.07	0.33
Geometric Mean	0.40	0.35	0.34	0.26		0.20
Spread Factor	1.44	1.30	1.28	1.48		2.59
Median Value	0.4	0.3	0.3	NQ	ND	NQ
90% Less Than	0.6	0.5	0.5	0.3	NQ	0.9
Bromodichloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	15		13		13	13
No. Detected	7		3		1	3
No. Above MDL	6		1		1	3
Arithmetic Mean	0.22		0.09		0.06	0.19
Standard Deviation	0.27		0.10		0.04	0.30
Geometric Mean	0.16					0.06
Spread Factor	2.61					5.21
Median Value	ND		ND		ND	ND
90% Less Than	0.5		NQ		ND	0.8
Maximum Value	1.0		0.4		0.2	0.9
Bromodichloromethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.070 ug/l)						
No. of Samples	14		9		13	10
No. Detected	14		9		12	9
No. Above MDL	13		8		3	3
Arithmetic Mean	0.2475		0.1951		0.0669	0.3167
Standard Deviation	0.1763		0.1080		0.0733	0.8058
Geometric Mean	0.1902		0.1751		0.0274	0.0166
Spread Factor	2.18		1.67		3.82	15.30
Median Value	0.240		0.170		NQ	NQ
90% Less Than	0.500		0.440		0.220	0.270
Maximum Value	0.640		0.440		0.230	2.600

TABLE G-3-10
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Dibromochloromethane: LLE ECD (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	108	108	105	95	107	99
No. Detected	108	106	100	55	0	69
No. Above MDL	67	54	45	1	0	32
Arithmetic Mean	0.22	0.20	0.18	0.11	ND	0.28
Standard Deviation	0.10	0.07	0.07	0.05		0.40
Geometric Mean	0.21	0.19	0.18			0.10
Spread Factor	1.48	1.39	1.35			3.87
Median Value	0.2	NQ	NQ	NQ	ND	NQ
90% Less Than	0.3	0.3	0.3	NQ	ND	0.8
Dibromochloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	15		13		13	13
No. Detected	2		1		0	2
No. Above MDL	0		0		0	1
Arithmetic Mean	NQ		NQ		ND	0.09
Standard Deviation						0.11
Median Value	ND		ND		ND	ND
90% Less Than	NQ		ND		ND	NQ
Maximum Value	NQ		NQ		ND	0.4
Dibromochloromethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	14		9		13	10
No. Detected	14		9		9	10
No. Above MDL	10		5		0	2
Arithmetic Mean	0.1867		0.1253		NQ	0.0755
Standard Deviation	0.2409		0.1886			0.1367
Geometric Mean	0.1022		0.0573			0.0075
Spread Factor	3.13		3.53			10.02
Median Value	0.088		0.060		NQ	NQ
90% Less Than	0.460		0.610		NQ	0.091
Maximum Value	0.920		0.610		NQ	0.460
Bromoform: LLE ECD (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	108	108	105	95	107	99
No. Detected	11	9	7	0	1	21
No. Above MDL	5	4	4	0	0	17
Arithmetic Mean	0.07	0.06	0.06	ND	NQ	0.15
Standard Deviation	0.08	0.06	0.06			0.26
Geometric Mean						0.04
Spread Factor						5.03
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND	ND	0.4
Bromoform: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-3-10
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Bromoform: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.040 ug/l)						
No. of Samples	14		9		13	10
No. Detected	8		4		0	6
No. Above MDL	3		1		0	2
Arithmetic Mean	0.0600		0.0833		ND	0.1841
Standard Deviation	0.1464		0.2202			0.5328
Geometric Mean	0.0071					0.0019
Spread Factor	9.00					35.72
Median Value	NQ		ND		ND	NQ
90% Less Than	0.100		0.670		ND	0.041
Maximum Value	0.560		0.670		ND	1.700
Dichloroiodomethane: LLE ECD (IDL= 0.5 ug/l;MDL= 0.5 ug/l)						
No. of Samples						1
No. Detected						0
No. Above MDL						0
Arithmetic Mean						ND
Median Value						ND
90% Less Than						ND
Dichloroiodomethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Total Trihalomethanes: LLE ECD (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	107	107	105	95	107	99
No. Detected	107	107	105	91	87	98
No. Above MDL	107	107	105	85	71	97
Arithmetic Mean	2.54	2.73	2.64	2.06	0.96	1.87
Standard Deviation	0.89	0.57	0.60	1.13	0.96	1.65
Geometric Mean	2.44	2.67	2.57	1.50	0.43	1.25
Spread Factor	1.28	1.22	1.29	2.79	4.40	2.58
Median Value	2.5	2.6	2.6	2.2	0.5	1.1
90% Less Than	3.1	3.5	3.4	3.2	2.5	4.3
Bromochloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-3-10
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Bromomethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Carbon Tetrachloride: LLE ECD (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	108	108	105	95	107	99
No. Detected	1	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride: purge & trap GCMS (IDL= 0.3 ug/l;MDL= 0.5 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Chloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Dichlorodifluoromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-3-10
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Dichloromethane (Methylene chloride): purge & trap GCMS (IDL= 0.1 ug/l; MDL= 2.0 ug/l)						
No. of Samples	15		13		13	13
No. Detected	3		2		3	2
No. Above MDL	1		0		0	0
Arithmetic Mean	0.38		NQ		NQ	NQ
Standard Deviation	0.80					
Median Value	ND		ND		ND	ND
90% Less Than	NQ		NQ		NQ	NQ
Maximum Value	3.0		NQ		NQ	NQ
Iodoform: purge & trap GCMS (IDL= 0.1 ug/l; MDL=NA ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Trichlorofluoromethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.4 ug/l)						
No. of Samples	15		13		13	13
No. Detected	2		4		1	1
No. Above MDL	0		1		1	1
Arithmetic Mean	NQ		0.13		0.08	0.29
Standard Deviation			0.14		0.10	0.87
Median Value	ND		ND		ND	ND
90% Less Than	NQ		NQ		ND	ND
Maximum Value	NQ		0.5		0.4	3.2
Chloroethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.2 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dibromoethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.1 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-3-10
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2-Dibromoethane: CLS GCMS						
(IDL= 0.002 ug/l;MDL= 0.050 ug/l)						
No. of Samples	14		9		13	10
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1-Dichloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	15		13		13	13
No. Detected	2		1		1	2
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		NQ	NQ
Median Value	ND		ND		ND	ND
90% Less Than	NQ		ND		ND	NQ
Maximum Value	NQ		NQ		NQ	NQ
1,2-Dichloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachloroethane: CLS GCMS						
(IDL= 0.010 ug/l;MDL= 0.050 ug/l)						
No. of Samples	14		9		13	10
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-3-10
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Hexachloroethane: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 7.5 ug/l)						
No. of Samples	7		7		7	7
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1,2,2-Tetrachloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1,2,2-Tetrachloroethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	14		9		13	10
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1,1-Trichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	15		13		13	13
No. Detected	6		4		1	2
No. Above MDL	4		3		0	0
Arithmetic Mean	0.15		0.11		NQ	NQ
Standard Deviation	0.18		0.10			
Geometric Mean	0.11		0.15			
Spread Factor	2.44		1.56			
Median Value	ND		ND		ND	ND
90% Less Than	0.4		0.3		ND	NQ
Maximum Value	0.7		0.3		NQ	NQ
1,1,2-Trichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-3-10
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,1,2-Trichloroethane: CLS GCMS						
(IDL= 0.001 ug/l;MDL= 0.070 ug/l)						
No. of Samples	14		9		13	10
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dibromo-3-chloropropane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dichloropropane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dichloropropane: CLS GCMS						
(IDL= 0.001 ug/l;MDL= 0.080 ug/l)						
No. of Samples	14		9		13	10
No. Detected	1		1		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		NQ		ND	ND
Maximum Value	NQ		NQ		ND	ND

TABLE G-3-11
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chloroethene (Vinyl chloride): purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		1		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		NQ		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		NQ		NQ	ND
cis-1,2-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
trans-1,2-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Tetrachloroethene: LLE ECD (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	108	108	105	95	107	99
No. Detected	108	108	104	29	43	4
No. Above MDL	69	40	37	0	0	0
Arithmetic Mean	0.68	0.45	0.46	NQ	NQ	NQ
Standard Deviation	0.74	0.44	0.50			
Geometric Mean	0.48	0.30	0.27			
Spread Factor	2.18	2.28	2.56			
Median Value	0.5	NQ	NQ	ND	ND	ND
90% Less Than	1.3	0.8	1.0	NQ	NQ	ND

TABLE G-3-11
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Tetrachloroethene: purge & trap GCMS (IDL= 0.2 ug/l; MDL= 0.5 ug/l)						
No. of Samples	15		13		13	13
No. Detected	15		12		0	0
No. Above MDL	10		5		0	0
Arithmetic Mean	0.88		0.63		ND	ND
Standard Deviation	0.74		0.48			
Geometric Mean	0.65		0.40			
Spread Factor	2.15		2.52			
Median Value	0.5		NQ		ND	ND
90% Less Than	1.7		1.4		ND	ND
Maximum Value	3.0		1.7		ND	ND
Tetrachloroethene: CLS GCMS (IDL= 0.010 ug/l; MDL= 0.020 ug/l)						
No. of Samples	14		9		13	10
No. Detected	13		7		11	9
No. Above MDL	13		7		10	8
Arithmetic Mean	0.4904		0.1871		0.0632	0.0956
Standard Deviation	0.3431		0.1820		0.0752	0.1157
Geometric Mean	0.3452		0.1040		0.0404	0.0532
Spread Factor	2.89		3.88		2.63	3.13
Median Value	0.360		0.180		0.044	0.053
90% Less Than	0.950		0.610		0.110	0.170
Maximum Value	1.200		0.610		0.290	0.390
Trichloroethene: LLE ECD (IDL= 0.1 ug/l; MDL= 0.3 ug/l)						
No. of Samples	108	108	105	95	107	99
No. Detected	52	36	40	2	12	1
No. Above MDL	3	1	1	1	0	0
Arithmetic Mean	0.13	0.10	0.11	0.11	NQ	NQ
Standard Deviation	0.10	0.07	0.08	0.61		
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	NQ	NQ	ND	NQ	ND
Trichloroethene: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.7 ug/l)						
No. of Samples	15		13		13	13
No. Detected	3		1		0	1
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		ND	NQ
Median Value	ND		ND		ND	ND
90% Less Than	NQ		ND		ND	ND
Maximum Value	NQ		NQ		ND	NQ
Trichloroethene: CLS GCMS (IDL= 0.001 ug/l; MDL= 0.130 ug/l)						
No. of Samples	14		9		13	10
No. Detected	5		1		2	3
No. Above MDL	5		1		2	3
Arithmetic Mean	0.0335		0.0149		0.0166	0.0543
Standard Deviation	0.0533		0.0432		0.0418	0.0906
Geometric Mean						0.1012
Spread Factor						60
Median Value	ND		ND		ND	ND
90% Less Than	0.095		0.130		0.070	0.[illegible]0
Maximum Value	0.170		0.130		0.140	0.[illegible]40

TABLE G-3-11
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
cis-1,2-Dichloropropene: Purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
cis-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
trans-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachlorobutadiene: purge & trap GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)						
No. of Samples	15		13		13	13
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachlorobutadiene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	14		9		13	10
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-3-11
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent (After Re-carbonation)	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Hexachlorobutadiene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=12.0 ug/l)						
No. of Samples	7		7		7	7
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Benzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Ethenylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Ethenylbenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.020 ug/l)				
No. of Samples	14	9	13	10
No. Detected	6	4	9	4
No. Above MDL	4	1	3	2
Arithmetic Mean	0.0186	0.0104	0.0519	0.0341
Standard Deviation	0.0297	0.0135	0.1072	0.0866
Geometric Mean	0.0102		0.0025	0.0023
Spread Factor	3.46		19.91	12.48
Median Value	ND	ND	NQ	ND
90% Less Than	0.043	0.044	0.100	0.021
Maximum Value	0.110	0.044	0.390	0.280
Ethylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Ethylbenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.040 ug/l)				
No. of Samples	14	9	13	10
No. Detected	4	1	4	3
No. Above MDL	1	0	2	1
Arithmetic Mean	0.0120	NQ	0.0160	0.0130
Standard Deviation	0.0200		0.0261	0.0210
Geometric Mean			0.0161	
Spread Factor			2.48	
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	0.052	NQ
Maximum Value	0.075	NQ	0.088	0.068

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Propylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.3 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Propylbenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.010 ug/l)				
No. of Samples	14	9	13	10
No. Detected	2	0	2	2
No. Above MDL	0	0	0	1
Arithmetic Mean	NQ	ND	NQ	0.0019
Standard Deviation				0.0032
Median Value	ND	ND	ND	ND
90% Less Than	NQ	ND	NQ	NQ
Maximum Value	NQ	ND	NQ	0.010
Toluene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	15	13	13	13
No. Detected	1	0	0	0
No. Above MDL	1	0	0	0
Arithmetic Mean	0.13	ND	ND	ND
Standard Deviation	0.30			
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	1.2	ND	ND	ND
Toluene: CLS GCMS (IDL= 0.020 ug/l;MDL= 0.090 ug/l)				
No. of Samples	14	9	13	10
No. Detected	4	0	2	1
No. Above MDL	1	0	1	1
Arithmetic Mean	0.0325	ND	0.0404	0.0310
Standard Deviation	0.0491		0.0968	0.0664
Median Value	ND	ND	ND	ND
90% Less Than	NQ	ND	NQ	ND
Maximum Value	0.190	ND	0.360	0.220
1,2-Xylene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2-Xylene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.030 ug/l)				
No. of Samples	14	9	13	10
No. Detected	4	2	4	3
No. Above MDL	1	1	0	1
Arithmetic Mean	0.0098	0.0081	NQ	0.0108
Standard Deviation	0.0158	0.0123		0.0170
Median Value	ND	ND	ND	ND
90% Less Than	NQ	0.038	NQ	NQ
Maximum Value	0.060	0.038	NQ	0.056
1,3-Xylene/1,4-Xylene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3-Xylene/1,4-Xylene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.040 ug/l)				
No. of Samples	14	9	13	10
No. Detected	4	1	4	3
No. Above MDL	1	0	2	1
Arithmetic Mean	0.0130	NQ	0.0115	0.0142
Standard Deviation	0.0237		0.0150	0.0246
Geometric Mean			0.0380	
Spread Factor			1.05	
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	0.040	NQ
Maximum Value	0.090	NQ	0.042	0.080
Nitrobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 2.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Methyl-2,4-dinitrobenzene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Methyl-2,6-Dinitrobenzene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzylbutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	5	5	5	5
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Di-n-Butylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 9.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dicyclohexylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Diethylphthalate: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 9.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Diisobutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dimethylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL=10.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dioctylphthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Diphenylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Phenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dimethylphenol: Acid LLE (w/ methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dinitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Methyl-4,6-dinitrophenol: Acid LLE (w/ methyl.) GCMS (IDL=10.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Nitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
4-Nitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthene: CLS GCMS (IDL= 0.010 ug/l;MDL=NA ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 3.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthylene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)				
No. of Samples	5	5	5	5
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Napthalene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Napthalene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.040 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	1	1
No. Above MDL	0	0	1	0
Arithmetic Mean	ND	ND	0.0081	NQ
Standard Deviation			0.0111	
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	0.045	NQ
Napthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Anthracene: CLS GCMS (IDL= 0.050 ug/l;MDL= 0.090 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Anthracene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 6.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzidine: Base neut. LLE GCMS (IDL=50.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Benzo(a)anthracene: Base neut. LLE GCMS				
(IDL= 1.0 ug/l:MDL= 7.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(b)fluoranthene: Base neut. LLE GCMS				
(IDL= 1.0 ug/l:MDL=10.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(k)fluoranthene: Base neut. LLE GCMS				
(IDL= 1.0 ug/l:MDL=10.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(g,h,i)perylene: Base neut. LLE GCMS				
(IDL= 1.0 ug/l:MDL=20.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Benzo(a)pyrene: Base neut. LLE GCMS				
(IDL= 1.0 ug/l:MDL=10.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chrysene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 6.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Dibenzo(a,h)anthracene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 9.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
3,3'-Dichlorobenzidine: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Diphenylhydrazine/Azobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 7.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Diphenylhydrazine/Azobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.100 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Fluoranthene: Base neut. LLE GCMS				
(IDL= 0.5 ug/l; MDL= 5.0 ug/l)				
No. of Samples	5	5	5	5
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Fluorene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l; MDL= 3.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Fluorene: CLS GCMS				
(IDL= 0.010 ug/l; MDL= 0.080 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene: Base neut. LLE GCMS				
(IDL= 5.0 ug/l; MDL=30.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Phenanthrene: Base neut. LLE GCMS				
(IDL= 0.5 ug/l; MDL= 5.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-12
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Phenanthrene: CLS GCMS				
(IDL= 0.050 ug/l;MDL= 0.120 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Pyrene: Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples	5	5	5	5
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Bromobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Bromobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Bromobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Chlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Chlorobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.020 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
4-Chloro-1-methylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chloro-1-methylbenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	15	13	13	13
No. Detected	9	8	0	0
No. Above MDL	6	4	0	0
Arithmetic Mean	0.16	0.13	ND	ND
Standard Deviation	0.11	0.08		
Geometric Mean	0.18	0.17		
Spread Factor	1.50	1.27		
Median Value	NQ	NQ	ND	ND
90% Less Than	0.3	0.2	ND	ND
Maximum Value	0.4	0.3	ND	ND
1,2-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	1	1	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
1,2-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	14	9	13	10
No. Detected	14	9	1	0
No. Above MDL	13	7	1	0
Arithmetic Mean	0.1041	0.0968	0.0470	ND
Standard Deviation	0.1387	0.1186	0.1692	
Geometric Mean	0.0668	0.0547		
Spread Factor	2.39	3.10		
Median Value	0.058	0.053	ND	ND
90% Less Than	0.190	0.390	ND	ND
Maximum Value	0.560	0.390	0.610	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,3-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	15	13	13	13
No. Detected	1	2	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
1,3-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	14	9	13	10
No. Detected	14	8	3	2
No. Above MDL	4	1	1	0
Arithmetic Mean	0.0170	0.0123	0.0231	NQ
Standard Deviation	0.0114	0.0109	0.0773	
Geometric Mean	0.0142			
Spread Factor	1.99			
Median Value	NQ	NQ	ND	ND
90% Less Than	0.035	0.040	NQ	NQ
Maximum Value	0.037	0.040	0.280	NQ
1,4-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	15	13	13	13
No. Detected	2	1	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND
Maximum Value	NQ	NQ	ND	ND
1,4-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 6.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,4-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	14	9	13	10
No. Detected	14	9	5	1
No. Above MDL	11	7	1	0
Arithmetic Mean	0.0408	0.0359	0.0324	NQ
Standard Deviation	0.0427	0.0285	0.1046	
Geometric Mean	0.0314	0.0297		
Spread Factor	2.01	1.90		
Median Value	0.028	0.026	ND	ND
90% Less Than	0.056	0.093	NQ	ND
Maximum Value	0.180	0.093	0.380	NQ
Hexachlorobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 2.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Hexachlorobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.050 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloro-2-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloro-3-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloro-4-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2,3-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2,3-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)				
No. of Samples	14	9	13	10
No. Detected	1	1	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
1,2,4-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2,4-Trichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 8.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2,4-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l:MDL= 0.020 ug/l)				
No. of Samples	14	9	13	10
No. Detected	2	3	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
1,3,5-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l:MDL= 0.5 ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3,5-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l:MDL= 0.020 ug/l)				
No. of Samples	14	9	13	10
No. Detected	1	1	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
2-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 8.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloro-3-methylphenol: Acid LLE Methyl GCMS (IDL= 5.0 ug/l:MDL=NA ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
3-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL=NA ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 9.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chloro-3-methylphenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 7.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 7.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Pentachlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 4.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
2,3,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,3,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	7	7	7	6
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l;MDL=NA ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloronaphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloronaphthalene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l;MDL=NA ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloronaphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 9.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloronaphthalene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Arochlor 1016: LLE ECD				
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1221: LLE ECD				
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1232: LLE ECD				
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1242: LLE ECD				
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1248: LLE ECD				
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-13
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Arochlor 1254: LLE ECD (IDL= 0.1 ug/l;MDL= 0.4 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Arochlor 1260: LLE ECD (IDL= 0.1 ug/l;MDL= 0.4 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-14
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Aldrin: LLE ECD				
(IDL= 0.01 ug/l:MDL= 0.10 ug/l)				
No. of Samples	2	2	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Atrazine: Base neut. LLE GCMS				
(IDL= 5.0 ug/l:MDL= 9.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Alpha-BHC: LLE ECD				
(IDL= 0.01 ug/l:MDL= 0.20 ug/l)				
No. of Samples	7	7	7	7
No. Detected	1	1	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
Beta-BHC: LLE ECD				
(IDL= 0.01 ug/l:MDL= 0.20 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Delta-BHC: LLE ECD				
(IDL= 0.01 ug/l:MDL= 0.03 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-14
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Gamma-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.02 ug/l)				
No. of Samples	7	7	7	7
No. Detected	7	6	0	0
No. Above MDL	7	5	0	0
Arithmetic Mean	0.054	0.041	ND	ND
Standard Deviation	0.043	0.041		
Geometric Mean	0.046	0.031		
Spread Factor	1.67	2.21		
Median Value	0.04	0.03	ND	ND
90% Less Than	0.15	0.13	ND	ND
Maximum Value	0.15	0.13	ND	ND
Chlordane: LLE ECD				
(IDL= 0.01 ug/l;MDL=NA ug/l)				
No. of Samples	2	2	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4,4'-DDD: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4,4'-DDE: LLE ECD				
(IDL= 0.01 ug/l;MDL= 1.00 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4,4'-DDT: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.09 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-14
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Dieldrin: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples	2	2	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endrin: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.07 ug/l)				
No. of Samples	2	2	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endosulfan I: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)				
No. of Samples	7	7	7	7
No. Detected	4	2	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	NQ	ND	ND	ND
90% Less Than	NQ	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
Endosulfan II: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Endosulfan sulfate: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.02 ug/l)				
No. of Samples	7	7	7	7
No. Detected	1	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND
Maximum Value	NQ	ND	ND	ND

TABLE G-3-14
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Heptachlor: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.20 ug/l)				
No. of Samples	2	2	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Heptachlor epoxide: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples	2	2	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Hexachlorocyclopentadiene: Base neut. LLE GCMS				
(IDL= 1.0 ug/l;MDL=20.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Hexachlorocyclopentadiene: CLS GCMS				
(IDL= 0.010 ug/l;MDL= 0.340 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Kepone: LLE ECD				
(IDL= 0.01 ug/l;MDL= 2.00 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-14
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Methoxychlor: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.09 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Toxaphene: LLE ECD				
(IDL= 0.01 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,3,7,8-Tetrachlorodibenzo-p-dioxin: Base neut. LLE GCMS				
(IDL=10.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Tricresolphosphate: Base neut. LLE GCMS				
(IDL=50.0 ug/l;MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-D: LLE (w/ methyl.) ECD				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	6	7	7	7
No. Detected	1	0	1	0
No. Above MDL	1	0	1	0
Arithmetic Mean	0.07	ND	0.08	ND
Standard Deviation	0.04		0.07	
Geometric Mean	Not			
Spread Factor	Calculated			
Median Value	ND	ND	ND	ND
90% Less Than	0.2	ND	0.2	ND
Maximum Value	0.2	ND	0.2	ND

TABLE G-3-14
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
2,4,5-T: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)				
No. of Samples	6	7	7	7
No. Detected	0	0	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	NQ	ND
Maximum Value	ND	ND	NQ	ND
2,4,5-TP: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	6	7	7	7
No. Detected	0	1	1	0
No. Above MDL	0	1	0	0
Arithmetic Mean	ND	0.14	NQ	ND
Standard Deviation		0.23		
Median Value	ND	ND	ND	ND
90% Less Than	ND	0.7	NQ	ND
Maximum Value	ND	0.7	NQ	ND

TABLE G-3-15
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
N-Nitrosodimethylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL=10.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
N-Nitrosodiphenylamine: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 5.0 ug/l)				
No. of Samples	5	5	5	5
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
N-Nitrosodipropylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples	5	5	5	5
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Bromo-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Bromo-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-15
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloro-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 8.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloro-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l; MDL= 0.030 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloroethylvinylether: purge & trap GCMS (IDL= 0.1 ug/l; MDL=NA ug/l)				
No. of Samples	15	13	13	13
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloroethylvinylether: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL=NA ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,1'-(Methylenebis(oxy))-bis-2-chloroethane: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 3.0 ug/l)				
No. of Samples	5	5	5	5
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-3-15
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,1'-Oxybis(2-chloroethane): Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 4.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,1'-Oxybis(2-chloroethane): CLS GCMS (IDL= 0.005 ug/l;MDL= 0.080 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,2'-Oxybis(2-chloropropane): Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Tetrahydrofuran: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	15	13	13	13
No. Detected	5	3	2	1
No. Above MDL	5	3	2	1
Arithmetic Mean	0.56	0.18	0.10	0.09
Standard Deviation	0.97	0.29	0.15	0.15
Geometric Mean	0.08	0.07	0.06	
Spread Factor	10.27	4.83	3.03	
Median Value	ND	ND	ND	ND
90% Less Than	1.7	0.5	0.2	ND
Maximum Value	3.4	1.0	0.6	0.6
Acetone: purge & trap GCMS (IDL= 0.5 ug/l;MDL= 0.5 ug/l)				
No. of Samples	15	13	13	13
No. Detected	1	1	0	4
No. Above MDL	1	1	0	4
Arithmetic Mean	1.97	1.54	ND	5.82
Standard Deviation	6.65	4.65		16.41
Geometric Mean				0.09
Spread Factor				41.26
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	7.3
Maximum Value	26.0	17.0	ND	60.0

TABLE G-3-15
PROCESS PERFORMANCE -- 16 JULY 1982 TO 1 FEBRUARY 1983 (PHASE IIA)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
2-Butanone: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 1.0 ug/l)				
No. of Samples	15	13	13	13
No. Detected	1	0	0	1
No. Above MDL	0	0	0	1
Arithmetic Mean	NQ	ND	ND	0.18
Standard Deviation				0.49
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	1.8
Isophorone: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples	7	7	7	7
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Geosmin: CLS GCMS (IDL= 0.0005 ug/l;MDL= 0.0500 ug/l)				
No. of Samples	14	9	13	10
No. Detected	3	3	1	2
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	NQ	NQ
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	NQ
Maximum Value	NQ	NQ	NQ	NQ
Methylisoborneol: CLS GCMS (IDL= 0.0005 ug/l;MDL= 0.0400 ug/l)				
No. of Samples	14	9	13	10
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G - 3 - 16
PROCESS PERFORMANCE : 16 JULY 1982 - 2 FEBRUARY 1983 (PHASE IIA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
VOLATILE ORGANIC ANALYSIS (PURGE AND TRAP, GC/MS)
(Concentrations reported in ug/L)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
MISCELLANEOUS ORGANIC CHEMICALS				
Alcohols				
1-Butanol				
No. of Times Detected / No. of Samples	1 / 15	0 / 13	0 / 13	0 / 13
Range of Concentrations	0.1	ND	ND	ND
Alkanes				
Hexane				
No. of Times Detected / No. of Samples	3 / 15	1 / 13	0 / 13	1 / 13
Range of Concentrations	0.1	0.1	ND	0.1
2,4,4-Trimethylpentane				
No. of Times Detected / No. of Samples	2 / 15	2 / 13	1 / 13	0 / 13
Range of Concentrations	0.2 - 0.3	0.2	0.2	ND
Ethers				
2-Methoxy-2-methylpropane				
No. of Times Detected / No. of Samples	1 / 15	0 / 13	0 / 13	0 / 13
Range of Concentrations	0.1	ND	ND	ND
1,1'-Oxybisethane				
No. of Times Detected / No. of Samples	3 / 15	3 / 13	1 / 13	1 / 13
Range of Concentrations	0.1 - 1.4	0.1 - 1.5	1.2	0.1
Sulfur containing organic compounds				
Carbon disulfide				
No. of Times Detected / No. of Samples	2 / 15	0 / 13	0 / 13	0 / 13
Range of Concentrations	0.2 - 0.3	ND	ND	ND

TABLE G - 3 - 17
PROCESS PERFORMANCE : 16 JULY 1982 - 2 FEBRUARY 1983 (PHASE IIA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
ACID EXTRACTION (W / METHYLATION) AND GC/MS
(Concentrations reported in ug/L)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
MISCELLANEOUS ORGANIC CHEMICALS				
Organic Acids				
Decanoic acid				
No. of Times Detected / No. of Samples	0 / 7	0 / 7	0 / 7	1 / 6
Range of Concentrations	ND	ND	ND	1.8
Dodecanoic acid				
No. of Times Detected / No. of Samples	0 / 7	0 / 7	0 / 7	1 / 6
Range of Concentrations	ND	ND	ND	5
Octanoic acid				
No. of Times Detected / No. of Samples	0 / 7	0 / 7	0 / 7	1 / 6
Range of Concentrations	ND	ND	ND	1.9

TABLE G - 3 - 18
PROCESS PERFORMANCE : 16 JULY 1982 - 2 FEBRUARY 1983 (PHASE IIA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
BASE/NEUTRAL EXTRACTION AND GC/MS

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water

(No secondary compounds were identified by this technique at any process site.)

TABLE G - 3 - 19
PROCESS PERFORMANCE : 16 JULY 1982 - 2 FEBRUARY 1983 (PHASE IIA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)				
Alkylbenzenes				
(1,1-Dimethylpropyl)benzene				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.090	ND	ND	ND
1-Ethyl-2-methylbenzene				
No. of Times Detected / No. of Samples	2 / 14	1 / 9	.1 / 13	2 / 10
Range of Concentrations	.011 - .022	.007	.018	.009
1-Ethyl-4-methylbenzene				
No. of Times Detected / No. of Samples	2 / 14	0 / 9	0 / 13	1 / 10
Range of Concentrations	.0076 - .012	ND	ND	.007
1-Methyl-2-(1-methylethyl)benzene				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.0058	ND	ND	ND
1,2,3-Trimethylbenzene				
No. of Times Detected / No. of Samples	2 / 14	0 / 9	1 / 13	0 / 10
Range of Concentrations	.0089 - .023	ND	.006	ND
1,2,4-Trimethylbenzene				
No. of Times Detected / No. of Samples	2 / 14	0 / 9	1 / 13	1 / 10
Range of Concentrations	.010 - .054	ND	.016	.008
1,3,5-Trimethylbenzene				
No. of Times Detected / No. of Samples	2 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.0045 - .018	ND	ND	ND
Phenols				
2,6-Bis(1,1-dimethylethyl)-4-methylphenol				
No. of Times Detected / No. of Samples	1 / 14	1 / 9	0 / 13	0 / 10
Range of Concentrations	.066	.071	ND	ND
Other multiring aromatics				
2,3-Dihydro-1,1,3-trimethyl-3-phenylindene				
No. of Times Detected / No. of Samples	1 / 14	1 / 9	0 / 13	0 / 10
Range of Concentrations	1.6	.094	ND	ND
MISCELLANEOUS ORGANIC CHEMICALS				
Ketones				
2,2-Dimethyl-3-hexanone				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.006	ND	ND	ND
Organic Acids				
Hexadecanoic Acid				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	1 / 13	0 / 10
Range of Concentrations	.140	ND	.240	ND
Alcohols				
2,3-Dimethyl-2-hexanol				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.020	ND	ND	ND
2,2-Dimethyl-1-pentanol				
No. of Times Detected / No. of Samples	0 / 14	0 / 9	1 / 13	0 / 10
Range of Concentrations	ND	ND	.023	ND
2-Ethylhexanol				
No. of Times Detected / No. of Samples	0 / 14	0 / 9	1 / 13	0 / 10
Range of Concentrations	ND	ND	.008	ND
3-Heptanol				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.010	ND	ND	ND
3-Methyl-1-heptanol				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.021	ND	ND	ND
3-Methyl-4-heptanol				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.014	ND	ND	ND
4-Methyl-3-heptanol				
No. of Times Detected / No. of Samples	1 / 14	1 / 9	0 / 13	0 / 10
Range of Concentrations	.010	.003	ND	ND
4-Methyl-4-heptanol				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.005	ND	ND	ND
6-Methyl-3-heptanol				
No. of Times Detected / No. of Samples	1 / 14	1 / 9	0 / 13	0 / 10
Range of Concentrations	.014	.003	ND	ND
3-Methyl-1-hexanol				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.012	ND	ND	ND
4-Methyl-2-propylpentanol				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.034	ND	ND	ND

PROCESS PERFORMANCE : 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Aldehydes				
Decanal				
No. of Times Detected / No. of Samples	2 / 14	1 / 9	1 / 13	2 / 10
Range of Concentrations	.012 - .026	.028	.032	.031 - .092
Nonanal				
No. of Times Detected / No. of Samples	2 / 14	1 / 9	2 / 13	2 / 10
Range of Concentrations	.014 - .042	.048	.011 - .044	.041 - .090
Heptanal				
No. of Times Detected / No. of Samples	0 / 14	0 / 9	0 / 13	4 / 10
Range of Concentrations	ND	ND	ND	.0034 - .098
Octanal				
No. of Times Detected / No. of Samples	0 / 14	0 / 9	1 / 13	0 / 10
Range of Concentrations	ND	ND	.120	ND
Alkanes				
C13-alkanes				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.020	ND	ND	ND
2,4-Dimethylhexane				
No. of Times Detected / No. of Samples	0 / 14	1 / 9	1 / 13	0 / 10
Range of Concentrations	ND	.044	.040	ND
2,6-Dimethyloctane				
No. of Times Detected / No. of Samples	0 / 14	0 / 9	0 / 13	1 / 10
Range of Concentrations	ND	ND	ND	.031
Docosane				
No. of Times Detected / No. of Samples	0 / 14	0 / 9	1 / 13	1 / 10
Range of Concentrations	ND	ND	.026	.015
Dodecane				
No. of Times Detected / No. of Samples	1 / 14	1 / 9	1 / 13	0 / 10
Range of Concentrations	.010	.005	.020	ND
Octadecane				
No. of Times Detected / No. of Samples	0 / 14	0 / 9	0 / 13	1 / 10
Range of Concentrations	ND	ND	ND	.012
2,2,4,6,6-Pentamethylheptane				
No. of Times Detected / No. of Samples	1 / 14	1 / 9	0 / 13	0 / 10
Range of Concentrations	.021	.015	ND	ND
Undecane				
No. of Times Detected / No. of Samples	0 / 14	0 / 9	1 / 13	0 / 10
Range of Concentrations	ND	ND	.005	ND
Alkenes				
5-Methyl-1-hexene				
No. of Times Detected / No. of Samples	0 / 14	1 / 9	0 / 13	0 / 10
Range of Concentrations	ND	.026	ND	ND
3,4,5-Trimethyl-1-hexene				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.043	ND	ND	ND
Cyclic Alkanes				
Cyclopropylcyclohexane				
No. of Times Detected / No. of Samples	0 / 14	1 / 9	0 / 13	0 / 10
Range of Concentrations	ND	.005	ND	ND
1-Ethyl-3-methylcyclopentane				
No. of Times Detected / No. of Samples	0 / 14	1 / 9	0 / 13	0 / 10
Range of Concentrations	ND	.016	ND	ND
Methylcyclohexane				
No. of Times Detected / No. of Samples	0 / 14	0 / 9	1 / 13	1 / 10
Range of Concentrations	ND	ND	.036	.007
1,1,3-Trimethylcyclohexane				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.038	ND	ND	ND
1,3,5-Trimethylcyclohexane				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.006	ND	ND	ND
Cyclic Alkenes				
3,5-Bis(1,1-dimethylethyl)-4-hydroxy-2,4-cyclohexadien-1-one				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	0.22	ND	ND	ND
1-Methyl-4-(1-methylethenyl)cyclohexene				
No. of Times Detected / No. of Samples	2 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.013 - .014	ND	ND	ND
Esters				
Butyl-2-methylpropanoate				
No. of Times Detected / No. of Samples	2 / 14	0 / 9	0 / 13	1 / 10
Range of Concentrations	.007 - .040	ND	ND	.042
Butyl-2-propanoate				
No. of Times Detected / No. of Samples	1 / 14	1 / 9	1 / 13	1 / 10
Range of Concentrations	.016	.013	.016	.017
2,2-Dimethyl-3-hexanoate				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.005	ND	ND	ND

TABLE G - 3 - 19
PROCESS PERFORMANCE : 16 MARCH 1981 - 16 MARCH 1982 (PHASE IA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Ethenylbutanoate				
No. of Times Detected / No. of Samples	1 / 14	0 / 9	0 / 13	0 / 10
Range of Concentrations	.005	ND	ND	ND
Hexylbutanoate				
No. of Times Detected / No. of Samples	0 / 14	1 / 9	1 / 13	0 / 10
Range of Concentrations	ND	.043	.390	ND
7-Methylnonanoic acid, methyl ester				
No. of Times Detected / No. of Samples	0 / 14	0 / 9	1 / 13	0 / 10
Range of Concentrations	ND	ND	.010	ND
2-Methyl propanoic acid, butyl ester				
No. of Times Detected / No. of Samples	1 / 14	1 / 9	2 / 13	2 / 10
Range of Concentrations	.060	.700	.030 - .900	.040 - .058

TABLE G-3-20
PROCESS PERFORMANCE
16 JULY 1982 TO 2 FEBRUARY 1983
AMES TEST

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % Confidence Interval[1]	Mutagenic Ratio
		EEWTP Blended Influent (See Table F-20 for Results)			
		Dual Media Filter Effluent			
21-Jul-1982					
	TA98	106.00	.87	1.14	1.2
	TA98+S9	106.00	N.A.	N.A.	N.A.
	TA100	106.00	-1.27	3.54	1.0
	TA100+S9	106.00	N.A.	N.A.	N.A.
3-Aug-1982					
	TA98	71.90	2.88	1.36	1.9
	TA98+S9	71.90	9.95	2.51	4.0
	TA100	71.90	1.06	2.54	1.1
	TA100+S9	71.90	-.44	4.72	1.
18-Aug-1982					
	TA98	94.60	2.17	1.24	1.9
	TA98+S9	94.60	7.23	2.75	3.3
	TA100	94.60	1.15	4.22	1.1
	TA100+S9	94.60	3.43	3.69	1.1
31-Aug-1982					
	TA98	121.10	.67	1.12	1.3
	TA98+S9	121.10	.70	.90	1.4
	TA100	121.10	.65	4.12	1.2
	TA100+S9	121.10	1.17	2.94	1.0
21-Sep-1982					
	TA98	87.10	2.12	1.54	1.8
	TA98+S9	87.10	5.16	1.83	2.5
	TA100	87.10	-2.18	6.02	1.1
	TA100+S9	87.10	1.11	3.59	1.1
22-Sep-1982					
	TA98	121.10	1.13	1.58	1.6
	TA98+S9	121.10	.31	2.14	1.7
	TA100	121.10	6.28	1.96	1.5
	TA100+S9	121.10	4.50	2.21	1.3
6-Oct-1982					
	TA98	87.10	2.86	2.25	1.7
	TA98+S9	87.10	11.09	3.46	3.5
	TA100	87.10	5.21	2.30	1.3
	TA100+S9	87.10	6.69	4.50	1.4
25-Oct-1982					
	TA98	83.30	2.88	2.69	2.2
	TA98+S9	83.30	8.59	1.89	2.5
	TA100	83.30	6.66	3.64	1.3
	TA100+S9	83.30	.93	6.36	1.3
2-Nov-1982					
	TA98	83.30	2.05	1.24	2.1
	TA98+S9	83.30	5.72	2.69	2.7
	TA100	83.30	.82	5.00	1.1
	TA100+S9	83.30	3.77	5.23	1.2
16-Nov-1982					
	TA98	79.50	1.28	1.76	1.3
	TA98+S9	79.50	N.A.	N.A.	N.A.
	TA100	79.50	-1.07	11.98	1.1
	TA100+S9	79.50	N.A.	N.A.	N.A.
30-Nov-1982					
	TA98	83.30	5.89	2.22	3.6
	TA98+S9	83.30	11.09	2.66	5.4
	TA100	83.30	9.05	7.48	1.6
	TA100+S9	83.30	10.64	7.56	1.6
14-Dec-1982					
	TA98	75.70	1.13	1.97	1.3
	TA98+S9	75.70	5.57	1.62	2.1
	TA100	75.70	3.32	8.72	1.4
	TA100+S9	75.70	2.24	5.83	1.1
21-Dec-1982					
	TA98	106.00	.24	.79	1.3
	TA98+S9	106.00	-.34	.84	1.2
	TA100	106.00	-.19	3.13	1.6
	TA100+S9	106.00	1.94	2.03	1.3
11-Jan-1983					
	TA98	71.90	-.44	1.53	.8
	TA98+S9	71.90	1.85	1.16	1.5
	TA100	71.90	1.91	6.78	1.0
	TA100+S9	71.90	6.73	7.67	1.1

TABLE G-3-20
PROCESS PERFORMANCE
16 JULY 1982 TO 2 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		Dual Media Filter Effluent (continued)			
25-Jan-1983					
	TA98	64.30	7.51	1.74	2.5
	TA98+S9	64.30	N.A.	N.A.	N.A.
	TA100	64.30	5.58	9.04	1.4
	TA100+S9	64.30	N.A.	N.A.	N.A.
8-Feb-1983					
	TA98	83.30	1.64	.84	1.7
	TA98+S9	83.30	1.79	.95	1.7
	TA100	83.30	.88	3.38	1.2
	TA100+S9	83.30	7.28	4.41	1.5
15-Feb-1983					
	TA98	41.60	1.32	2.46	1.6
	TA98+S9	41.60	1.16	2.19	1.5
	TA100	41.60	4.65	10.85	1.5
	TA100+S9	41.60	5.11	15.69	1.7

1. Numbers refer to the size of the interval bracketing the corresponding specific activity value; i.e. Specific Activity ± Confidence Interval.

TABLE G-3-20
PROCESS PERFORMANCE
16 JULY 1982 TO 2 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % Confidence Interval [1]	Mutagenic Ratio
		Final Carbon Column Effluent			
21-Jul-1982					
	TA98	83.30	-.56	1.01	.8
	TA98+S9	83.30	.20	1.13	1.
	TA100	83.30	2.31	1.50	1.1
	TA100+S9	83.30	-.76	3.85	1.
3-Aug-1982					
	TA98	47.30	.12	2.97	1.0
	TA98+S9	47.30	1.66	1.72	1.3
	TA100	47.30	-6.75	8.30	1.2
	TA100+S9	47.30	-4.92	5.26	1.
18-Aug-1982					
	TA98	117.30	.59	.70	1.3
	TA98+S9	117.30	.58	1.24	1.4
	TA100	117.30	-3.03	3.19	1.
	TA100+S9	117.30	-2.74	3.06	.9
31-Aug-1982					
	TA98	113.60	.10	1.11	1.3
	TA98+S9	113.60	.12	1.20	1.2
	TA100	113.60	-3.65	1.99	1.
	TA100+S9	113.60	1.11	2.77	1.1
22-Sep-1982					
	TA98	90.80	.38	1.56	1.1
	TA98+S9	90.80	.38	1.72	1.3
	TA100	90.80	1.26	3.60	1.2
	TA100+S9	90.80	.86	5.48	1.2
6-Oct-1982					
	TA98	94.60	1.41	.90	1.8
	TA98+S9	94.60	-.20	.99	.9
	TA100	94.60	-4.96	2.84	1.1
	TA100+S9	94.60	-2.39	4.22	.9
25-Oct-1982					
	TA98	98.40	.50	1.82	1.8
	TA98+S9	98.40	1.04	1.10	1.2
	TA100	98.40	1.13	2.80	1.1
	TA100+S9	98.40	3.27	3.74	1.2
2-Nov-1982					
	TA98	79.50	-.23	.97	1.
	TA98+S9	79.50	.26	1.39	1.1
	TA100	79.50	-4.93	7.15	1.
	TA100+S9	79.50	-3.44	7.13	.9
16-Nov-1982					
	TA98	106.00	.40	1.13	1.6
	TA98+S9	106.00	.59	1.28	1.2
	TA100	106.00	-3.65	3.30	1.
	TA100+S9	106.00	-3.17	2.53	.9
30-Nov-1982					
	TA98	117.00	.54	.93	1.5
	TA98+S9	117.00	.61	1.14	1.7
	TA100	117.00	1.17	3.92	1.3
	TA100+S9	117.00	4.51	3.64	1.4
21-Dec-1982					
	TA98	106.00	N.A.	N.A.	N.A.
	TA98+S9	106.00	-.46	1.03	1.4
	TA100	106.00	-27.08	18.48	.4
	TA100+S9	106.00	1.70	3.31	1.5
29-Dec-1982					
	TA98	106.00	-.71	.88	.9
	TA98+S9	106.00	-.62	.37	.9
	TA100	106.00	-3.45	5.08	.8
	TA100+S9	106.00	-5.10	4.00	1.
25-Jan-1983					
	TA98	79.50	1.57	1.46	1.6
	TA98+S9	79.50	-.15	1.73	1.
	TA100	79.50	-2.75	5.47	.9
	TA100+S9	79.50	1.44	4.73	1.2
8-Feb-1983					
	TA98	83.30	.37	.72	1.2
	TA98+S9	83.30	2.66	.82	2.0
	TA100	83.30	-2.09	3.28	1.2
	TA100+S9	83.30	4.63	3.36	1.3
15-Feb-1983					
	TA98	68.13	1.99	1.23	1.8
	TA98+S9	68.13	.61	2.14	1.9
	TA100	68.13	N.A.	N.A.	N.A.
	TA100+S9	68.13	N.A.	N.A.	N.A.
		EEWTP Finished Water (See Table H-20 for Results)			

SECTION 4

PROCESS PERFORMANCE
2 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)

OVERVIEW

This appendix provides statistical summary tables for the EEWTP process sites during the lime phase of operation between 1 February 1983 and 16 March 1983 (Phase IIB). This period of operation utilized the same unit processes as Phase IA, except that final disinfection was with free chlorine (rather than ozone and chloramines) for a portion of the phase. Ozonation and ammonia addition were stopped on 23 February 1983.

These data have not been summarized in the main body of this report due to time constraints.

The data are organized by parameter group, as indicated below:

G-4-1	Physical/Aesthetic Parameters
G-4-2	Asbestos Fibers a. Concentration b. Characterization
G-4-3	Major Cations, Anions and Nutrients
G-4-4	Trace Metals
G-4-5	Radiological Parameters
G-4-6	Microbiological Parameters
G-4-7	Viruses
G-4-8	Parasites
G-4-9	Organic Surrogate Parameters - TOC and TOX
G-4-10	Synthetic Organic Chemicals - Halogenated Alkanes
G-4-11	Synthetic Organic Chemicals - Halogenated Alkenes
G-4-12	Synthetic Organic Chemicals - Aromatic Hydrocarbons (Non-Halogenated)
G-4-13	Synthetic Organic Chemicals - Halogenated Aromatics
G-4-14	Synthetic Organic Chemicals - Pesticides/Herbicides
G-4-15	Synthetic Organic Chemicals - Miscellaneous Quantified Organic Chemicals
G-4-16	Organic chemicals Tentatively Identified by Volatile Organic Analysis (Purge and Trap GC/MS)
G-4-17	Organic Chemicals Tentatively Identified by Acid Extraction (w/Methylation) and GC/MS
G-4-18	Organic Chemicals Tentatively Identified by Base/Neutral Extraction and GC/MS
G-4-19	Organic Chemicals Tentatively Identified by Closed Loop Stripping and GC/MS

Process Performance
2 February 1983 to 16 March 1983 (Phase IIB)

All the data reported here are from 24-hour composite samples unless noted otherwise (next to parameter name). In some cases, a negligible number of composite samples were missed, and grab samples taken in their place are included with the data analysis.

TABLE G-4-1
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
PHYSICAL/AESTHETIC PARAMETERS

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Temperature, deg. C [in-situ readings]						
No. of Readings	42					41
Arithmetic Mean	8.2					9.0
Standard Deviation	4.0					3.7
Median Value	7.0					9.6
Minimum Value	2.5					3.5
Maximum Value	14.0					14.1
pH [grab samples]						
No. of Readings	257	505	251		251	251
Arithmetic Mean	7.3	11.0	7.7		7.5	7.4
Standard Deviation	0.4	0.2	0.2		0.2	0.2
Geometric Mean	7.3	11.0	7.7		7.5	7.4
Spread Factor	1.06	1.02	1.03		1.02	1.03
Median Value	7.3	11.0	7.7		7.5	7.4
Minimum Value	6.7	10.1	7.0		7.1	7.0
Maximum Value	8.2	11.5	8.6		8.0	7.9
Dissolved Oxygen [grab samples] (MDL=0.15 mg/l)						
No. of Readings	42	41	41	39	39	41
Arithmetic Mean	12.6	12.7	11.4	10.5	9.3	10.5
Standard Deviation	2.7	2.5	2.6	3.2	3.5	3.0
Geometric Mean	12.4	12.5	11.1	10.0	8.6	10.0
Spread Factor	1.23	1.21	1.25	1.38	1.52	1.34
Median Value	11.0	12.6	11.2	11.4	10.4	11.2
Minimum Value	8.8	9.3	7.4	4.5	2.9	6.4
Maximum Value	16.6	16.7	15.5	16.1	15.4	15.4
Turbidity (MDL= 0.05 NTU)						
No. of Samples	2					2
No. Above MDL	2					2
Arithmetic Mean	6.50					0.38
Standard Deviation	0.00					0.11
Geometric Mean	Not					0.37
Spread Factor	Calculated					1.22
Median Value	6.50					0.30
90% Less Than	6.50					0.45
Turbidity [grab samples] (MDL= 0.05 NTU)						
No. of Samples	258	253	261		253	253
No. Above MDL	258	253	261		253	253
Arithmetic Mean	14.93	2.52	0.34		0.08	0.08
Standard Deviation	9.68	1.34	0.29		0.04	0.04
Geometric Mean	12.98	2.25	0.26		0.07	0.07
Spread Factor	1.63	1.59	2.09		1.52	1.52
Median Value	12.00	2.10	0.25		0.10	0.05
90% Less Than	26.00	4.00	0.65		0.10	0.10

TABLE G-4-1
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
PHYSICAL/AESTHETIC PARAMETERS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Suspended Solids (TSS) (MDL= 3.6 mg/l)						
No. of Samples	6	6	6		6	
No. Above MDL	5	6	4		1	
Arithmetic Mean	10.57	4.10	1.60		2.10	
Standard Deviation	6.39	1.63	1.10		0.73	
Geometric Mean	8.99	4.21	Not			
Spread Factor	1.92	1.29	Calculated			
Median Value	10.3	3.6	0.6		ND	
90% Less Than	20.7	6.0	3.6		3.6	
Apparent Color (MDL= 3 color units)						
No. of Samples	5		5			5
No. Above MDL	5		5			5
Arithmetic Mean	39.0		15.0			15.0
Standard Deviation	5.5		0.0			0.0
Geometric Mean	38.7		Not			Not
Spread Factor	1.13		Calculated			Calculated
Median Value	35		15			15
90% Less Than	45		15			15
MBAS (MDL= 0.03 mg/l)						
No. of Samples	1		1			1
No. Above MDL	1		1			0
Arithmetic Mean	0.040		0.030			ND
Median Value	0.04		0.03			ND
90% Less Than	0.04		0.03			ND
Odor (MDL= 1 TON)						
No. of Samples					11	11
No. Above MDL					10	11
Arithmetic Mean					9.1	32.0
Standard Deviation					6.6	22.1
Geometric Mean					6.6	24.2
Spread Factor					2.57	2.22
Median Value					8	40
90% Less Than					17	67
Free Chlorine [grab samples] (MDL= 0.1 mg/l-Cl)						
No. of Samples						273
No. Above MDL						273
Arithmetic Mean						1.35
Standard Deviation						1.39
Median Value						0.2
90% Less Than						3.0

TABLE G-4-1
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
PHYSICAL/AESTHETIC PARAMETERS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Chlorine [grab samples] (MDL= 0.1 mg/l-Cl)						
No. of Samples						272
No. Above MDL						272
Arithmetic Mean						3.06
Standard Deviation						0.39
Geometric Mean						3.03
Spread Factor						1.18
Median Value						3.1
90% Less Than						3.3

TABLE G-4-2
PROCESS PERFORMANCE
2 FEBRUARY 1983 TO 16 MARCH 1983
ASBESTOS FIBER CONCENTRATIONS

(Monitoring for asbestos fibers was discontinued after Phase IIA)

TABLE G-4-3
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
MAJOR CATIONS, ANIONS, AND NUTRIENTS

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Dissolved Solids (TDS): by addition (MDL= 1 mg/l)					
No. of Samples	12		12		11
No. Above MDL	12		12		11
Arithmetic Mean	198.8		245.3		238.4
Standard Deviation	32.2		37.3		34.1
Geometric Mean	196.1		242.5		236.2
Spread Factor	1.19		1.16		1.15
Median Value	211		247		226
90% Less Than	226		287		282
Electroconductivity [grab samples] (MDL= 0.1 umho/cm)					
No. of Samples	267		12		11
No. Above MDL	267		12		11
Arithmetic Mean	344.0		467.5		468.6
Standard Deviation	65.7		77.5		70.5
Geometric Mean	337.5		461.4		463.8
Spread Factor	1.22		1.18		1.16
Median Value	360.0		465.0		470.0
90% Less Than	410.0		555.0		540.0
Calcium (MDL= 0.2 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	11	8	11
Arithmetic Mean	36.30	69.82	62.73	59.98	62.18
Standard Deviation	5.47	15.71	11.96	12.15	12.24
Geometric Mean	35.91	68.12	61.65	58.89	61.07
Spread Factor	1.16	1.26	1.21	1.21	1.21
Median Value	37.9	73.6	65.6	59.0	64.0
90% Less Than	42.3	89.0	79.0	80.0	77.0
Hardness: by addition (Ca+Mg, as CaCO3) (MDL= 1.0 mg/l-CaCO3)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	11	8	11
Arithmetic Mean	116.1	189.8	171.0	163.9	169.0
Standard Deviation	14.5	37.0	28.1	27.5	27.9
Geometric Mean	115.3	186.5	168.9	161.9	166.9
Spread Factor	1.13	1.21	1.17	1.17	1.17
Median Value	121	198	176	158	169
90% Less Than	130	238	212	213	206
Magnesium (MDL= 0.1 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	11	8	11
Arithmetic Mean	6.19	3.76	3.48	3.43	3.33
Standard Deviation	0.53	0.92	0.96	1.21	1.13
Geometric Mean	6.17	3.67	3.38	3.24	3.15
Spread Factor	1.08	1.24	1.28	1.41	1.40
Median Value	6.1	3.4	3.2	3.3	3.2
90% Less Than	7.1	5.4	5.1	5.3	5.3

TABLE G-4-3
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Potassium (MDL= 0.3 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	11	8	11
Arithmetic Mean	4.12	3.29	3.55	2.98	3.54
Standard Deviation	1.50	1.45	1.47	1.29	1.43
Geometric Mean	3.82	3.02	3.27	2.77	3.27
Spread Factor	1.51	1.50	1.52	1.44	1.50
Median Value	5.0	2.7	3.0	2.3	3.0
90% Less Than	5.4	5.3	5.2	5.1	5.1
Sodium (MDL= 0.1 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	11	8	11
Arithmetic Mean	20.52	20.22	20.27	19.70	21.05
Standard Deviation	5.88	7.88	5.36	7.63	6.68
Geometric Mean	19.64	19.05	19.59	18.64	20.13
Spread Factor	1.36	1.40	1.31	1.38	1.35
Median Value	24.0	18.6	19.4	18.5	19.6
90% Less Than	25.5	37.3	25.5	36.2	25.6
Alkalinity (MDL= 2.7 mg/l-CaCO3)					
No. of Samples	15		12		11
No. Above MDL	15		12		11
Arithmetic Mean	56.07		105.83		102.73
Standard Deviation	11.74		20.21		21.02
Geometric Mean	54.90		104.24		100.99
Spread Factor	1.23		1.19		1.20
Median Value	60.0		100.0		90.0
90% Less Than	70.0		140.0		130.0
Bromide (MDL= 0.003 mg/l)					
No. of Samples	15		12		11
No. Above MDL	6		3		2
Arithmetic Mean	0.0121		0.0061		0.0033
Standard Deviation	0.0191		0.0094		0.0056
Geometric Mean	0.0021		0.0006		0.0005
Spread Factor	9.81		12.21		6.34
Median Value	ND		ND		ND
90% Less Than	0.027		0.020		0.003
Chloride (MDL= 0.1 mg/l)					
No. of Samples	15		12		11
No. Above MDL	15		12		11
Arithmetic Mean	40.33		42.75		46.00
Standard Deviation	13.00		14.19		14.16
Geometric Mean	37.70		40.35		43.90
Spread Factor	1.49		1.42		1.37
Median Value	46.0		37.0		42.0
90% Less Than	53.0		59.0		63.0

TABLE G-4-3
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Cyanide, Total (MDL= 0.005 mg/l)					
No. of Samples	11				12
No. Above MDL	4				1
Arithmetic Mean	0.0051				0.0028
Standard Deviation	0.0047				0.0010
Geometric Mean	0.0037				
Spread Factor	2.32				
Median Value	ND				ND
90% Less Than	0.011				ND
Fluoride (MDL= 0.10 mg/l)					
No. of Samples	15		12		11
No. Above MDL	15		12		11
Arithmetic Mean	0.36		0.36		0.28
Standard Deviation	0.15		0.14		0.13
Geometric Mean	0.32		0.33		0.25
Spread Factor	1.72		1.61		1.69
Median Value	0.4		0.4		0.3
90% Less Than	0.5		0.5		0.4
Nitrogen, Nitrite + Nitrate (MDL= 0.02 mg/l-N)					
No. of Samples	15		12	11	11
No. Above MDL	15		12	11	11
Arithmetic Mean	5.53		4.88	4.48	4.83
Standard Deviation	2.92		3.10	2.98	3.13
Geometric Mean	4.48		3.86	3.56	3.91
Spread Factor	2.07		2.06	2.01	1.93
Median Value	7.0		2.8	3.2	3.3
90% Less Than	8.3		8.1	8.1	9.0
Nitrogen, Ammonia (MDL= 0.02 mg/l-N)					
No. of Samples	15		12	11	11
No. Above MDL	12		5	5	7
Arithmetic Mean	0.151		0.097	0.078	0.422
Standard Deviation	0.149		0.127	0.097	0.390
Geometric Mean	0.091		0.016	0.021	0.094
Spread Factor	3.27		11.67	7.45	12.56
Median Value	0.10		ND	ND	0.50
90% Less Than	0.30		0.20	0.20	0.80
Nitrogen, Total Kjeldahl (MDL= 0.2 mg/l-N)					
No. of Samples	15		12	11	11
No. Above MDL	15		12	11	11
Arithmetic Mean	0.88		0.73	0.70	0.88
Standard Deviation	0.39		0.37	0.39	0.51
Geometric Mean	0.82		0.66	0.61	0.74
Spread Factor	1.45		1.53	1.68	1.87
Median Value	0.8		0.6	0.5	1.1
90% Less Than	1.7		1.4	1.2	1.3

TABLE G-4-3
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Ortho Phosphate (MDL= 0.01 mg/l-P)					
No. of Samples	15		12	11	11
No. Above MDL	12		1	0	0
Arithmetic Mean	0.110		0.010	ND	ND
Standard Deviation	0.073		0.019		
Geometric Mean	0.063				
Spread Factor	4.04				
Median Value	0.15		ND	ND	ND
90% Less Than	0.17		ND	ND	ND
Silica (MDL= 0.2 mg/l)					
No. of Samples	15		12		11
No. Above MDL	15		12		11
Arithmetic Mean	6.76		5.58		5.27
Standard Deviation	1.70		1.95		1.78
Geometric Mean	6.55		5.17		4.94
Spread Factor	1.29		1.53		1.48
Median Value	6.2		5.1		5.0
90% Less Than	8.7		7.5		7.2
Sulfate (MDL= 0.6 mg/l)					
No. of Samples	15		12		11
No. Above MDL	15		12		11
Arithmetic Mean	40.00		37.67		38.18
Standard Deviation	8.33		7.77		8.27
Geometric Mean	39.07		36.88		37.31
Spread Factor	1.25		1.23		1.25
Median Value	44.0		38.0		42.0
90% Less Than	47.0		47.0		47.0

TABLE G-4-4
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
TRACE METALS

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Aluminum (MDL= 0.003 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	8	4	4	4
Arithmetic Mean	0.2900	0.0435	0.0082	0.0183	0.0182
Standard Deviation	0.1948	0.0242	0.0103	0.0301	0.0287
Geometric Mean	0.2201	0.0320	0.0017	0.0038	0.0014
Spread Factor	2.30	2.85	8.32	8.43	20.55
Median Value	0.270	0.050	ND	ND	ND
90% Less Than	0.650	0.080	0.020	0.090	0.050
Antimony (MDL= 0.0003 mg/l)					
No. of Samples	1				
No. Above MDL	0				
Arithmetic Mean	ND				
Median Value	ND				
90% Less Than	ND				
Arsenic (MDL= 0.0002 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	8	9	7	4	4
Arithmetic Mean	0.00039	0.00029	0.00017	0.00016	0.00024
Standard Deviation	0.00014	0.00008	0.00006	0.00007	0.00030
Geometric Mean	0.00038	0.00028	0.00020	0.00019	0.00013
Spread Factor	1.40	1.30	1.17	1.24	2.81
Median Value	0.0004	0.0003	0.0002	ND	ND
90% Less Than	0.0005	0.0004	0.0002	0.0003	0.0003
Barium (MDL= 0.002 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	11	8	11
Arithmetic Mean	0.0262	0.0193	0.0172	0.0169	0.0181
Standard Deviation	0.0082	0.0065	0.0051	0.0072	0.0055
Geometric Mean	0.0249	0.0183	0.0163	0.0154	0.0173
Spread Factor	1.40	1.40	1.41	1.56	1.36
Median Value	0.027	0.018	0.018	0.016	0.018
90% Less Than	0.036	0.029	0.022	0.026	0.025
Beryllium (MDL= 0.0008 mg/l)					
No. of Samples	1				
No. Above MDL	0				
Arithmetic Mean	ND				
Median Value	ND				
90% Less Than	ND				

TABLE G-4-4
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Boron (MDL= 0.0040 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	11	8	11
Arithmetic Mean	0.02431	0.02824	0.02290	0.02789	0.02278
Standard Deviation	0.00824	0.01347	0.01069	0.01463	0.01176
Geometric Mean	0.02254	0.02510	0.02000	0.02321	0.01966
Spread Factor	1.55	1.66	1.76	2.03	1.79
Median Value	0.0263	0.0244	0.0261	0.0247	0.0233
90% Less Than	0.0331	0.0478	0.0306	0.0531	0.0402
Cadmium: furnace AAS (MDL= 0.0002 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	1	0	0	0	0
Arithmetic Mean	0.00016	ND	ND	ND	ND
Standard Deviation	0.00017				
Median Value	ND	ND	ND	ND	ND
90% Less Than	0.0006	ND	ND	ND	ND
Chromium: furnace AAS (MDL= 0.0002 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	11	8	10
Arithmetic Mean	0.00948	0.00821	0.00431	0.00413	0.00368
Standard Deviation	0.00725	0.00210	0.00101	0.00072	0.00146
Geometric Mean	0.00577	0.00792	0.00420	0.00407	0.00294
Spread Factor	3.79	1.33	1.25	1.18	2.63
Median Value	0.0107	0.0088	0.0040	0.0040	0.0038
90% Less Than	0.0239	0.0107	0.0057	0.0054	0.0051
Cobalt: furnace AAS (MDL= 0.0001 mg/l)					
No. of Samples	1				
No. Above MDL	1				
Arithmetic Mean	0.00320				
Median Value	0.0032				
90% Less Than	0.0032				
Copper: flame AAS (MDL= 0.0012 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	8	10	6	6
Arithmetic Mean	0.00876	0.00426	0.00364	0.00165	0.00176
Standard Deviation	0.00421	0.00268	0.00183	0.00091	0.00147
Geometric Mean	0.00775	0.00332	0.00318	0.00160	0.00136
Spread Factor	1.67	2.22	1.80	1.50	2.22
Median Value	0.0095	0.0046	0.0040	0.0015	0.0013
90% Less Than	0.0135	0.0081	0.0059	0.0035	0.0035

TABLE G-4-4
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Iron (MDL= 0.003 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	10	3	5
Arithmetic Mean	0.9911	0.5100	0.0486	0.0077	0.0037
Standard Deviation	0.5326	0.2820	0.0251	0.0128	0.0033
Geometric Mean	0.8507	0.4049	0.0367	0.0017	0.0029
Spread Factor	1.79	2.24	2.73	6.67	2.22
Median Value	0.960	0.540	0.053	ND	ND
90% Less Than	1.900	0.960	0.065	0.038	0.006
Lead (MDL= 0.0003 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	8	5	3	5
Arithmetic Mean	0.00341	0.00177	0.00042	0.00029	0.00037
Standard Deviation	0.00379	0.00190	0.00035	0.00029	0.00027
Geometric Mean	0.00205	0.00118	0.00029	0.00022	0.00030
Spread Factor	2.82	2.56	2.52	2.19	2.15
Median Value	0.0026	0.0012	ND	ND	ND
90% Less Than	0.0126	0.0066	0.0009	0.0010	0.0008
Lithium: flame AAS (MDL= 0.0004 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	11	8	11
Arithmetic Mean	0.00371	0.00344	0.00331	0.00339	0.00325
Standard Deviation	0.00097	0.00083	0.00070	0.00087	0.00082
Geometric Mean	0.00358	0.00335	0.00324	0.00329	0.00314
Spread Factor	1.32	1.26	1.23	1.28	1.34
Median Value	0.0040	0.0034	0.0034	0.0029	0.0036
90% Less Than	0.0049	0.0045	0.0042	0.0045	0.0039
Manganese (MDL= 0.0010 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	8	3	2
Arithmetic Mean	0.10136	0.02547	0.00288	0.00125	0.00069
Standard Deviation	0.07295	0.01619	0.00174	0.00113	0.00044
Geometric Mean	0.07630	0.02087	0.00229	0.00078	0.00055
Spread Factor	2.23	1.94	2.27	2.81	1.97
Median Value	0.0864	0.0248	0.0032	ND	ND
90% Less Than	0.2070	0.0591	0.0047	0.0033	0.0013
Mercury (MDL= 0.00027 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	2	4	3	3	2
Arithmetic Mean	0.00017	0.00046	0.00061	0.00043	0.00031
Standard Deviation	0.00007	0.00051	0.00127	0.00068	0.00039
Geometric Mean	Not	0.00024	0.00007	0.00017	0.00004
Spread Factor	Calculated	3.43	9.18	3.93	8.51
Median Value	ND	ND	ND	ND	ND
90% Less Than	0.0003	0.0015	0.0007	0.0021	0.0011

TABLE G-4-4
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Molybdenum					
(MDL= 0.002 mg/l)					
No. of Samples	1				
No. Above MDL	0				
Arithmetic Mean	ND				
Median Value	ND				
90% Less Than	ND				
Nickel					
(MDL= 0.0010 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	8	4	6	4	7
Arithmetic Mean	0.00602	0.00571	0.00412	0.00409	0.00491
Standard Deviation	0.00437	0.00745	0.00522	0.00439	0.00515
Geometric Mean	0.00467	0.00095	0.00151	0.00133	0.00236
Spread Factor	2.22	11.58	5.23	6.41	4.29
Median Value	0.0046	ND	0.0030	ND	0.0042
90% Less Than	0.0137	0.0181	0.0099	0.0111	0.0094
Selenium					
(MDL= 0.0002 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	4	3	5	4	9
Arithmetic Mean	0.00026	0.00029	0.00039	0.00029	0.00082
Standard Deviation	0.00019	0.00040	0.00058	0.00034	0.00061
Geometric Mean	0.00020	0.00011	0.00017	0.00019	0.00058
Spread Factor	2.27	4.05	3.76	2.52	2.56
Median Value	ND	ND	ND	ND	0.0008
90% Less Than	0.0005	0.0013	0.0008	0.0011	0.0017
Silver: furnace AAS					
(MDL= 0.0002 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	7	8	0	0	0
Arithmetic Mean	0.00081	0.00032	ND	ND	ND
Standard Deviation	0.00083	0.00016			
Geometric Mean	0.00049	0.00030			
Spread Factor	3.00	1.52			
Median Value	0.0006	0.0003	ND	ND	ND
90% Less Than	0.0025	0.0006	ND	ND	ND
Thallium					
(MDL= 0.0009 mg/l)					
No. of Samples	1				
No. Above MDL	0				
Arithmetic Mean	ND				
Median Value	ND				
90% Less Than	ND				

TABLE G-4-4
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
TRACE METALS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Tin					
(MDL= 0.0040 mg/l)					
No. of Samples	1				
No. Above MDL	0				
Arithmetic Mean	ND				
Median Value	ND				
90% Less Than	ND				
Titanium					
(MDL= 0.0020 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	7	8	0	0	0
Arithmetic Mean	0.00923	0.00889	ND	ND	ND
Standard Deviation	0.00754	0.00532			
Geometric Mean	0.00586	0.00696			
Spread Factor	3.06	2.26			
Median Value	0.0072	0.0097	ND	ND	ND
90% Less Than	0.0227	0.0149	ND	ND	ND
Vanadium					
(MDL= 0.0020 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	5	8	8	6	5
Arithmetic Mean	0.00306	0.00803	0.00379	0.00283	0.00271
Standard Deviation	0.00231	0.00434	0.00215	0.00131	0.00219
Geometric Mean	0.00243	0.00682	0.00340	0.00281	0.00195
Spread Factor	2.17	1.93	1.79	1.44	2.46
Median Value	0.0026	0.0081	0.0043	0.0029	ND
90% Less Than	0.0070	0.0139	0.0056	0.0046	0.0058
Zinc: flame AAS					
(MDL= 0.0012 mg/l)					
No. of Samples	9	9	11	8	11
No. Above MDL	9	9	8	4	10
Arithmetic Mean	0.02013	0.00729	0.00445	0.00208	0.00768
Standard Deviation	0.01322	0.00490	0.00426	0.00159	0.00588
Geometric Mean	0.01407	0.00557	0.00279	0.00143	0.00537
Spread Factor	2.68	2.22	2.92	2.70	2.55
Median Value	0.0214	0.0078	0.0041	ND	0.0036
90% Less Than	0.0350	0.0149	0.0106	0.0039	0.0135

TABLE G-4-5
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
RADIOLOGICAL PARAMETERS

	Blended Influent	EEWTP Finished Water
Gross Alpha		
(MDL= 0.1 pCi/l)		
No. of Samples	1	3
No. Above MDL	0	0
Arithmetic Mean	ND	ND
Median Value	ND	ND
90% Less Than	ND	ND
Gross Alpha 2s Error		
(MDL= 0.1 pCi/l)		
No. of Samples	1	3
No. Above MDL	1	3
Arithmetic Mean	0.40	0.33
Standard Deviation		0.23
Geometric Mean		0.29
Spread Factor		1.68
Median Value	0.4	0.2
90% Less Than	0.4	0.6
Gross Beta		
(MDL= 0.1 pCi/l)		
No. of Samples	1	3
No. Above MDL	1	3
Arithmetic Mean	6.20	3.40
Standard Deviation		2.00
Geometric Mean		3.06
Spread Factor		1.56
Median Value	6.2	2.4
90% Less Than	6.2	5.7
Gross Beta 2s Error		
(MDL= 0.1 pCi/l)		
No. of Samples	1	3
No. Above MDL	1	3
Arithmetic Mean	1.20	1.00
Standard Deviation		0.17
Geometric Mean		0.99
Spread Factor		1.15
Median Value	1.2	0.9
90% Less Than	1.2	1.2
Tritium (Radiological)		
(MDL=1000 pCi/l)		
No. of Samples	1	
No. Above MDL	0	
Arithmetic Mean	ND	
Median Value	ND	
90% Less Than	ND	

TABLE G-4-6
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
MICROBIOLOGICAL PARAMETERS

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	Ozonation Effluent	EEWTP Finished Water
Total Coliform (confirmed): 1000,100,10 ml [grab samples] (MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)						
No. of Samples					12	21
No. of Positives					6	4
No. of TNTC					0	0
Geometric Mean					0.0174	0.0038
Spread Factor					2.64	6.11
Median Value					ND	ND
90% Less Than					0.080	0.060
Maximum Value					0.080	0.090
Total Coliform (confirmed): 100,10,1 ml [grab samples] (MDL=0.18 MPN/100 ml;UQL=240 MPN/100 ml)						
No. of Samples			5	21		
No. of Positives			5	21		
No. of TNTC			1	1		
Geometric Mean			14.718	11.019		
Spread Factor			15.55	4.45		
Median Value			92.00	11.00		
90% Less Than			>UQL	54.00		
Maximum Value			>UQL	>UQL		
Total Coliform (confirmed): 0.1,0.01,0.001 ml [grab samples] (MDL=180 MPN/100 ml;UQL=240000 MPN/100 m)						
No. of Samples	5					
No. of Positives	5					
No. of TNTC	0					
Geometric Mean	2862.5					
Spread Factor	5.59					
Median Value	2200					
90% Less Than	24000					
Maximum Value	24000					
Total Coliform (completed): 1000,100,10 ml [grab samples] (MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)						
No. of Samples					12	18
No. of Positives					6	1
No. of TNTC					0	0
Geometric Mean					0.0175	
Spread Factor					2.37	
Median Value					ND	ND
90% Less Than					0.050	ND
Maximum Value					0.080	0.020
Fecal Coliform (confirmed): 1000,100,10 ml [grab samples] (MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)						
No. of Samples					12	21
No. of Positives					4	1
No. of TNTC					0	0
Geometric Mean					Not	
Spread Factor					Calculated	
Median Value					ND	ND
90% Less Than					0.020	ND
Maximum Value					0.020	0.040

TABLE G-4-6
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
MICROBIOLOGICAL PARAMETERS
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Final Carbon Column Effluent	Ozonation Effluent	EEWTP Finished Water
Fecal Coliform (confirmed): 100,10,1 ml [grab samples]						
(MDL=0.18 MPN/100 ml;UQL=240 MPN/100 ml)						
No. of Samples			5	21		
No. of Positives			3	13		
No. of TNTC			0	0		
Geometric Mean			1.697	0.494		
Spread Factor			73.58	14.46		
Median Value			35.00	1.10		
90% Less Than			54.00	17.00		
Maximum Value			54.00	54.00		
Fecal Coliform (confirmed): 0.1,0.01,0.001 ml [grab samples]						
(MDL=180 MPN/100 ml;UQL=240000 MPN/100 m)						
No. of Samples	4					
No. of Positives	3					
No. of TNTC	0					
Geometric Mean	709.4					
Spread Factor	7.79					
Median Value	200					
90% Less Than	4900					
Maximum Value	4900					
Standard Plate Count: 1 ml [grab samples]						
(MDL=1.0 colonies/ml)						
No. of Samples			5	20	11	20
No. of Positives			5	19	8	7
Geometric Mean			184.5	17.6	1.3	0.7
Spread Factor			3.24	4.85	3.30	2.30
Median Value			300	12	1	ND
90% Less Than			520	105	7	2
Maximum Value			520	540	19	4
Standard Plate Count: 0.01 ml [grab samples]						
(MDL=100 colonies/ml)						
No. of Samples	5					
No. of Positives	5					
Geometric Mean	6695.8					
Spread Factor	2.39					
Median Value	8000					
90% Less Than	15500					
Maximum Value	15500					

TABLE G-4-7
PROCESS PERFORMANCE
2 FEBRUARY 1983 TO 16 MARCH 1983
VIRUS ASSAY

(Monitoring for viruses was discontinued after Phase IIA)

TABLE G-4-8
PROCESS PERFORMANCE
2 FEBRUARY 1983 TO 16 MARCH 1983
PARASITES

(Monitoring for parasites was discontinued after Phase IIA)

TABLE G-4-9
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
ORGANIC SURROGATE PARAMETERS -- TOC AND TOX

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Total Organic Carbon: DC80 (MDL=0.06 mg/l-C)						
No. of Samples	23	24	24	23	23	23
No. Above MDL	23	24	24	23	23	23
Arithmetic Mean	3.73	2.59	2.20	1.76	1.21	1.25
Standard Deviation	0.97	0.68	0.53	0.30	0.17	0.15
Geometric Mean	3.60	2.52	2.14	1.73	1.20	1.24
Spread Factor	1.31	1.27	1.26	1.18	1.15	1.12
Median Value	3.7	2.6	2.3	1.7	1.2	1.3
90% Less Than	5.0	3.3	2.8	2.1	1.4	1.4
Total Organic Carbon: DC80 [grab samples] (MDL=0.06 mg/l-C)						
No. of Samples	37	36	36	37	37	37
No. Above MDL	37	36	36	37	37	37
Arithmetic Mean	3.99	2.69	2.39	2.00	1.48	1.61
Standard Deviation	0.73	0.66	0.54	0.40	0.25	0.31
Geometric Mean	3.92	2.62	2.33	1.96	1.46	1.58
Spread Factor	1.19	1.25	1.25	1.21	1.18	1.20
Median Value	4.0	2.5	2.2	2.0	1.5	1.6
90% Less Than	5.0	3.4	3.0	2.5	1.8	1.9
Total Organic Halogen (MDL=3.9 ug/l-Cl)						
No. of Samples	23	24	23	24	24	24
No. Above MDL	23	24	23	24	24	24
Arithmetic Mean	74.87	59.38	56.96	47.50	37.71	54.58
Standard Deviation	20.19	17.15	19.23	16.02	12.68	19.78
Geometric Mean	72.02	56.80	53.29	45.01	35.85	50.83
Spread Factor	1.33	1.36	1.48	1.39	1.37	1.48
Median Value	80.0	55.0	55.0	45.0	35.0	55.0
90% Less Than	100.0	85.0	90.0	70.0	55.0	80.0

TABLE G-4-10
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chloroform: LLE ECD						
(IDL= 0.1 ug/l:MDL= 0.3 ug/l)						
No. of Samples	20	24	23	24	24	24
No. Detected	20	24	23	24	24	24
No. Above MDL	19	24	23	24	24	24
Arithmetic Mean	1.89	1.45	1.42	1.67	2.07	3.19
Standard Deviation	1.48	0.96	0.95	0.62	0.42	1.14
Geometric Mean	1.27	1.11	1.08	1.56	2.03	2.99
Spread Factor	2.67	2.17	2.20	1.46	1.21	1.44
Median Value	1.5	1.6	1.7	1.8	2.0	2.6
90% Less Than	3.2	2.8	2.7	2.5	2.4	4.6
Chloroform: purge & trap GCMS						
(IDL= 0.1 ug/l:MDL= 0.2 ug/l)						
No. of Samples	3		3		3	3
No. Detected	2		2		3	3
No. Above MDL	2		2		3	3
Arithmetic Mean	1.78		1.52		1.87	2.83
Standard Deviation	1.51		1.35		0.50	1.11
Geometric Mean	0.80		0.72		1.82	2.69
Spread Factor	5.80		5.19		1.25	1.39
Median Value	2.5		1.8		1.8	2.7
90% Less Than	2.8		2.7		2.4	4.0
Maximum Value	2.8		2.7		2.4	4.0
Bromodichloromethane: LLE ECD						
(IDL= 0.1 ug/l:MDL= 0.3 ug/l)						
No. of Samples	20	24	23	24	24	24
No. Detected	18	22	20	24	24	24
No. Above MDL	10	3	3	5	3	14
Arithmetic Mean	0.54	0.21	0.21	0.22	0.21	1.13
Standard Deviation	0.51	0.09	0.10	0.04	0.03	1.05
Geometric Mean	0.32			Not		0.47
Spread Factor	2.96			Calculated		4.63
Median Value	NQ	NQ	NQ	NQ	NQ	0.3
90% Less Than	1.2	0.3	0.3	0.3	0.3	2.6
Bromodichloromethane: purge & trap GCMS						
(IDL= 0.1 ug/l:MDL= 0.2 ug/l)						
No. of Samples	3		3		3	3
No. Detected	2		2		2	2
No. Above MDL	2		1		0	2
Arithmetic Mean	0.45		0.13		NQ	1.22
Standard Deviation	0.43		0.08			1.05
Geometric Mean	0.35					0.64
Spread Factor	2.39					4.47
Median Value	0.4		NQ		NQ	1.5
90% Less Than	0.9		0.2		NQ	2.1
Maximum Value	0.9		0.2		NQ	2.1
Bromodichloromethane: CLS GCMS						
(IDL= 0.001 ug/l:MDL= 0.070 ug/l)						
No. of Samples	2		3		2	2
No. Detected	2		2		2	2
No. Above MDL	1		1		2	1
Arithmetic Mean	0.0828		0.0587		0.1340	0.1978
Standard Deviation	0.0668		0.0726		0.0651	0.2295
Geometric Mean					0.1259	
Spread Factor					1.43	
Median Value	NQ		NQ		0.088	NQ
90% Less Than	0.130		0.140		0.180	0.360
Maximum Value	0.130		0.140		0.180	0.360

TABLE G-4-10
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Dibromochloromethane: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	20	24	23	24	24	24
No. Detected	10	11	11	24	5	15
No. Above MDL	9	2	2	0	0	11
Arithmetic Mean	0.36	0.10	0.10	NQ	NQ	1.15
Standard Deviation	0.45	0.06	0.06			1.28
Geometric Mean	0.17					0.21
Spread Factor	3.86					11.38
Median Value	ND	ND	ND	NQ	ND	NQ
90% Less Than	0.9	NQ	NQ	NQ	NQ	2.8
Dibromochloromethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	3		3		3	3
No. Detected	2		0		0	2
No. Above MDL	1		0		0	2
Arithmetic Mean	0.23		ND		ND	1.02
Standard Deviation	0.18					0.98
Geometric Mean						0.77
Spread Factor						2.56
Median Value	NQ		ND		ND	1.0
90% Less Than	0.4		ND		ND	2.0
Maximum Value	0.4		ND		ND	2.0
Dibromochloromethane: CLS GCMS						
(IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	2		3		2	2
No. Detected	1		2		2	2
No. Above MDL	1		1		1	1
Arithmetic Mean	0.0802		0.1120		0.0452	0.0728
Standard Deviation	0.1128		0.1719		0.0279	0.0668
Median Value	ND		NQ		NQ	NQ
90% Less Than	0.160		0.310		0.065	0.120
Maximum Value	0.160		0.310		0.065	0.120
Bromoform: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	20	24	23	24	24	24
No. Detected	2	0	0	0	0	10
No. Above MDL	2	0	0	0	0	10
Arithmetic Mean	0.08	ND	ND	ND	ND	0.30
Standard Deviation	0.08					0.31
Geometric Mean						0.18
Spread Factor						3.48
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	0.7
Bromoform: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-4-10
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Bromoform: CLS GCMS						
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)						
No. of Samples	2		3		2	2
No. Detected	1		1		1	0
No. Above MDL	0		1		0	0
Arithmetic Mean	NQ		0.0227		NQ	ND
Standard Deviation			0.0349			
Median Value	ND		ND		ND	ND
90% Less Than	NQ		0.063		NQ	ND
Maximum Value	NQ		0.063		NQ	ND
Dichloroiodomethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Total Trihalomethanes: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	20	24	23	24	24	24
No. Detected	20	24	23	24	24	24
No. Above MDL	20	24	23	24	24	24
Arithmetic Mean	2.75	1.68	1.64	1.99	2.30	5.71
Standard Deviation	2.38	1.06	1.06	0.65	0.44	3.75
Geometric Mean	1.65	1.31	1.27	1.89	2.26	4.52
Spread Factor	3.05	2.10	2.17	1.38	1.20	2.00
Median Value	1.7	1.8	1.9	2.1	2.2	2.9
90% Less Than	5.7	3.1	3.0	2.8	2.8	10.4
Bromochloromethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Bromomethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-4-10
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Carbon Tetrachloride: LLE ECD (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	20	24	23	24	24	24
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride: purge & trap GCMS (IDL= 0.3 ug/l;MDL= 0.5 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Chloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Dichlorodifluoromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Dichloromethane (Methylene chloride): purge & trap GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)						
No. of Samples	3		3		3	3
No. Detected	1		0		1	0
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		ND		NQ	ND
Median Value	ND		ND		ND	ND
90% Less Than	NQ		ND		NQ	ND
Maximum Value	NQ		ND		NQ	ND

TABLE G-4-10
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Iodoform: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Trichlorofluoromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	3		3		3	3
No. Detected	2		1		0	1
No. Above MDL	2		1		0	1
Arithmetic Mean	0.62		0.23		ND	0.27
Standard Deviation	0.70		0.32			0.38
Geometric Mean	0.50					
Spread Factor	2.23					
Median Value	0.4		ND		ND	ND
90% Less Than	1.4		0.6		ND	0.7
Maximum Value	1.4		0.6		ND	0.7
Chloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dibromoethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dibromoethane: CLS GCMS (IDL= 0.002 ug/l;MDL= 0.050 ug/l)						
No. of Samples	2		3		2	2
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-4-10
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,1-Dichloroethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.6 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dichloroethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.4 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachloroethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL=NA ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND				ND	ND
Hexachloroethane: CLS GCMS (IDL= 0.010 ug/l; MDL= 0.050 ug/l)						
No. of Samples	2		3		2	2
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachloroethane: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 7.5 ug/l)						
No. of Samples			1		1	1
No. Detected			0		0	0
No. Above MDL			0		0	0
Arithmetic Mean			ND		ND	ND
Median Value			ND		ND	ND
90% Less Than			ND		ND	ND
Maximum Value			ND		ND	ND

TABLE G-4-10
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,1,2,2-Tetrachloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1,2,2-Tetrachloroethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	2		3		2	2
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1,1-Trichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	3		3		3	3
No. Detected	2		2		2	1
No. Above MDL	2		1		0	0
Arithmetic Mean	0.18		0.13		NQ	NQ
Standard Deviation	0.13		0.08			
Geometric Mean	0.22					
Spread Factor	1.30					
Median Value	0.2		NQ		NQ	ND
90% Less Than	0.3		0.2		NQ	NQ
Maximum Value	0.3		0.2		NQ	NQ
1,1,2-Trichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1,2-Trichloroethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.070 ug/l)						
No. of Samples	2		3		2	2
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

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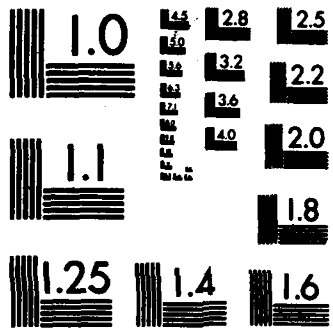

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TABLE G-4-10
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2-Dibromo-3-chloropropane: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.2 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dichloropropane: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.2 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,2-Dichloropropane: CLS GCMS (IDL= 0.001 ug/l; MDL= 0.080 ug/l)						
No. of Samples	2		3		2	2
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-4-11
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chloroethene (Vinyl chloride): purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.3 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
1,1-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.5 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
cis-1,2-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l; MDL=NA ug/l)						
No. of Samples	3		3		3	3
No. Detected	1		1		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	NQ		NQ		ND	ND
Maximum Value	NQ		NQ		ND	ND
trans-1,2-Dichloroethene: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.5 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Tetrachloroethene: LLE ECD (IDL= 0.1 ug/l; MDL= 0.4 ug/l)						
No. of Samples	20	24	23	24	24	24
No. Detected	20	24	23	24	11	0
No. Above MDL	13	12	10	0	0	0
Arithmetic Mean	1.54	0.85	0.72	NQ	NQ	ND
Standard Deviation	1.43	0.85	0.71			
Geometric Mean	0.79	0.43	0.36			
Spread Factor	3.75	3.47	3.44			
Median Value	0.9	NQ	NQ	NQ	ND	ND
90% Less Than	3.5	2.4	1.9	NQ	NQ	ND

TABLE G-4-11
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Tetrachloroethene: purge & trap GCMS (IDL= 0.2 ug/l;MDL= 0.5 ug/l)						
No. of Samples	3		3		3	3
No. Detected	2		2		0	0
No. Above MDL	2		2		0	0
Arithmetic Mean	1.33		1.10		ND	ND
Standard Deviation	1.07		0.95			
Geometric Mean	1.04		0.91			
Spread Factor	2.52		2.27			
Median Value	1.9		1.2		ND	ND
90% Less Than	2.0		2.0		ND	ND
Maximum Value	2.0		2.0		ND	ND
Tetrachloroethene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.020 ug/l)						
No. of Samples	2		3		2	2
No. Detected	2		3		2	2
No. Above MDL	2		3		2	2
Arithmetic Mean	0.2300		0.1533		0.0680	0.0900
Standard Deviation	0.1273		0.0577		0.0184	0.0424
Geometric Mean	0.2117		0.1469		0.0667	0.0849
Spread Factor	1.51		1.33		1.21	1.41
Median Value	0.140		0.120		0.055	0.060
90% Less Than	0.320		0.220		0.081	0.120
Maximum Value	0.320		0.220		0.081	0.120
Trichloroethene: LLE ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	20	24	23	24	24	24
No. Detected	13	14	13	2	1	0
No. Above MDL	1	0	0	0	0	0
Arithmetic Mean	0.15	NQ	NQ	NQ	NQ	ND
Standard Deviation	0.08					
Median Value	NQ	NQ	NQ	ND	ND	ND
90% Less Than	NQ	NQ	NQ	ND	ND	ND
Trichloroethene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.7 ug/l)						
No. of Samples	3		3		3	3
No. Detected	2		2		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	NQ		NQ		ND	ND
Median Value	NQ		NQ		ND	ND
90% Less Than	NQ		NQ		ND	ND
Maximum Value	NQ		NQ		ND	ND
Trichloroethene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.130 ug/l)						
No. of Samples	2		3		2	2
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-4-11
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
cis-1,2-Dichloropropene: Purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
cis-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
trans-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachlorobutadiene: purge & trap GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)						
No. of Samples	3		3		3	3
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND
Hexachlorobutadiene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	2		3		2	2
No. Detected	0		0		0	0
No. Above MDL	0		0		0	0
Arithmetic Mean	ND		ND		ND	ND
Median Value	ND		ND		ND	ND
90% Less Than	ND		ND		ND	ND
Maximum Value	ND		ND		ND	ND

TABLE G-4-11
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	Blended Influent	Sedimentation Effluent	Dual Media Filter Effluent	Lead Carbon Column Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Hexachlorobutadiene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=12.0 ug/l)						
No. of Samples			1		1	1
No. Detected			0		0	0
No. Above MDL			0		0	0
Arithmetic Mean			ND		ND	ND
Median Value			ND		ND	ND
90% Less Than			ND		ND	ND
Maximum Value			ND		ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Benzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Ethenylbenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL=NA ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Ethenylbenzene: CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.020 ug/l)				
No. of Samples	2	3	2	2
No. Detected	2	3	2	2
No. Above MDL	2	2	1	0
Arithmetic Mean	0.0335	0.0362	0.0262	NQ
Standard Deviation	0.0120	0.0209	0.0194	
Geometric Mean	0.0324	0.0319		
Spread Factor	1.30	1.82		
Median Value	0.025	0.044	NQ	NQ
90% Less Than	0.042	0.052	0.040	NQ
Maximum Value	0.042	0.052	0.040	NQ
Ethylbenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Ethylbenzene: CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Propylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.3 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Propylbenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.010 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Toluene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	1	1	0
No. Above MDL	0	1	1	0
Arithmetic Mean	ND	0.07	0.07	ND
Standard Deviation		0.03	0.03	
Median Value	ND	ND	ND	ND
90% Less Than	ND	0.1	0.1	ND
Maximum Value	ND	0.1	0.1	ND
Toluene: CLS GCMS (IDL= 0.020 ug/l;MDL= 0.090 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Xylene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2-Xylene: CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.030 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3-Xylene/1,4-Xylene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3-Xylene/1,4-Xylene: CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Nitrobenzene: Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 2.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1-Methyl-2,4-dinitrobenzene: Base neut. LLE GCMS				
(IDL= 1.0 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Methyl-2,6-Dinitrobenzene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Benzylbutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Bis(2-ethylhexyl)phthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	1
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	NQ
Median Value		ND	ND	NQ
90% Less Than		ND	ND	NQ
Maximum Value		ND	ND	NQ
Di-n-Butylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 9.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Dicyclohexylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Diethylphthalate: Base neut. LLE GCMS (IDL= 0.1 ug/l; MDL= 9.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Diisobutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l; MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Dimethylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL=10.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Dioctylphthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL= 8.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Diphenylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l; MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Phenol: Acid LLE (w/ methyl.) GCMS				
(IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dimethylphenol: Acid LLE (w/ methyl.) GCMS				
(IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dinitrophenol: Acid LLE (w/ methyl.) GCMS				
(IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Methyl-4,6-dinitrophenol: Acid LLE (w/ methyl.) GCMS				
(IDL=10.0 ug/l;MDL=NA ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Nitrophenol: Acid LLE (w/ methyl.) GCMS				
(IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
4-Nitrophenol: Acid LLE (w/ methyl.) GCMS				
(IDL= 1.0 ug/l:MDL= 8.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthene: CLS GCMS				
(IDL= 0.010 ug/l:MDL=NA ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acenaphthene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l:MDL= 3.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Acenaphthylene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l:MDL= 2.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Naphthalene: purge & trap GCMS				
(IDL= 0.1 ug/l:MDL= 0.5 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Naphthalene: CLS GCMS				
(IDL= 0.010 ug/l;MDL= 0.040 ug/l)				
No. of Samples	2	3	2	2
No. Detected	2	2	1	1
No. Above MDL	0	2	1	0
Arithmetic Mean	NQ	0.0363	0.0310	NQ
Standard Deviation		0.0283	0.0368	
Geometric Mean		0.0449		
Spread Factor		1.27		
Median Value	NQ	0.044	ND	ND
90% Less Than	NQ	0.060	0.057	NQ
Maximum Value	NQ	0.060	0.057	NQ
Naphthalene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l;MDL= 2.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Anthracene: CLS GCMS				
(IDL= 0.050 ug/l;MDL= 0.090 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Anthracene: Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 6.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Benzidine: Base neut. LLE GCMS				
(IDL=50.0 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Benzo(a)anthracene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Benzo(b)fluoranthene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Benzo(k)fluoranthene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Benzo(g,h,i)perylene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=20.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Benzo(a)pyrene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Chrysene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 6.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Dibenzo(a,h)anthracene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 9.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
3,3'-Dichlorobenzidine: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1,2-Diphenylhydrazine/Azobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 7.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1,2-Diphenylhydrazine/Azobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.100 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Fluoranthene: Base neut. LLE GCMS				
(IDL= 0.5 ug/l:MDL= 5.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Fluorene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l:MDL= 3.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Fluorene: CLS GCMS				
(IDL= 0.010 ug/l:MDL= 0.080 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene: Base neut. LLE GCMS				
(IDL= 5.0 ug/l:MDL=30.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Phenanthrene: Base neut. LLE GCMS				
(IDL= 0.5 ug/l:MDL= 5.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-12
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Phenanthrene: CLS GCMS (IDL= 0.050 ug/l;MDL= 0.120 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Pyrene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Bromobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Bromobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Bromobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Chlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Chlorobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.020 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
4-Chloro-1-methylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chloro-1-methylbenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	3	3	3	3
No. Detected	1	1	0	0
No. Above MDL	1	1	0	0
Arithmetic Mean	0.10	0.13	ND	ND
Standard Deviation	0.09	0.14		
Median Value	ND	ND	ND	ND
90% Less Than	0.2	0.3	ND	ND
Maximum Value	0.2	0.3	ND	ND
1,2-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1,2-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	2	3	2	2
No. Detected	2	3	0	0
No. Above MDL	2	2	0	0
Arithmetic Mean	0.0370	0.0300	ND	ND
Standard Deviation	0.0240	0.0180		
Geometric Mean	0.0329	0.0287		
Spread Factor	1.64	1.63		
Median Value	0.020	0.035	ND	ND
90% Less Than	0.054	0.045	ND	ND
Maximum Value	0.054	0.045	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,3-Dichlorobenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3-Dichlorobenzene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l;MDL= 4.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1,3-Dichlorobenzene: CLS GCMS				
(IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	2	3	2	2
No. Detected	2	3	1	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	NQ	ND
Median Value	NQ	NQ	ND	ND
90% Less Than	NQ	NQ	NQ	ND
Maximum Value	NQ	NQ	NQ	ND
1,4-Dichlorobenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	3	3	3	3
No. Detected	1	1	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	NQ	NQ	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	ND
Maximum Value	NQ	NQ	ND	ND
1,4-Dichlorobenzene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l;MDL= 6.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,4-Dichlorobenzene: CLS GCMS				
(IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)				
No. of Samples	2	3	2	2
No. Detected	2	3	0	0
No. Above MDL	1	2	0	0
Arithmetic Mean	0.0190	0.0227	ND	ND
Standard Deviation	0.0127	0.0110		
Geometric Mean		0.0244		
Spread Factor		1.29		
Median Value	NQ	0.028	ND	ND
90% Less Than	0.028	0.030	ND	ND
Maximum Value	0.028	0.030	ND	ND
Hexachlorobenzene: Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 2.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Hexachlorobenzene: CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.050 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloro-2-nitrobenzene: Base neut. LLE GCMS				
(IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1-Chloro-3-nitrobenzene: Base neut. LLE GCMS				
(IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloro-4-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1,2,3-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2,3-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2,4-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,2,4-Trichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 8.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,2,4-Trichlorobenzene: CLS GCMS				
(IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3,5-Trichlorobenzene: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1,3,5-Trichlorobenzene: CLS GCMS				
(IDL= 0.001 ug/l;MDL= 0.020 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chlorophenol: Acid LLE (w/ methyl.) GCMS				
(IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloro-3-methylphenol: Acid LLE Methyl GCMS				
(IDL= 5.0 ug/l;MDL=NA ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
3-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL=NA ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 9.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
4-Chloro-3-methylphenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 7.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4-Dichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 7.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Pentachlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL= 4.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
2,3,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,3,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,4,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)				
No. of Samples	1	1	1	1
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
1-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l;MDL=NA ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloronaphthalene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l;MDL= 2.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1-Chloronaphthalene: CLS GCMS				
(IDL= 0.001 ug/l;MDL= 0.050 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloronaphthalene: purge & trap GCMS				
(IDL= 0.5 ug/l;MDL=NA ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloronaphthalene: Base neut. LLE GCMS				
(IDL= 0.1 ug/l;MDL= 9.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
2-Chloronaphthalene: CLS GCMS				
(IDL= 0.001 ug/l;MDL= 0.050 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Arochlor 1016: LLE ECD				
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Arochlor 1221: LLE ECD				
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Arochlor 1232: LLE ECD				
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Arochlor 1242: LLE ECD				
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Arochlor 1248: LLE ECD				
(IDL= 0.2 ug/l;MDL= 0.4 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-13
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Arochlor 1254: LLE ECD (IDL= 0.1 us/l;MDL= 0.4 us/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Arochlor 1260: LLE ECD (IDL= 0.1 us/l;MDL= 0.4 us/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-14
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Aldrin: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Atrazine: Base neut. LLE GCMS				
(IDL= 5.0 ug/l;MDL= 9.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Alpha-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.20 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Beta-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.20 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Delta-BHC: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-14
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Gamma-BHC: LLE ECD (IDL= 0.01 ug/l;MDL= 0.02 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Chlordane: LLE ECD (IDL= 0.01 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
4,4'-DDD: LLE ECD (IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
4,4'-DDE: LLE ECD (IDL= 0.01 ug/l;MDL= 1.00 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
4,4'-DDT: LLE ECD (IDL= 0.01 ug/l;MDL= 0.09 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-14
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Dieldrin: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Endrin: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.07 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Endosulfan I: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Endosulfan II: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.03 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Endosulfan sulfate: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.02 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-14
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Heptachlor: LLE ECD (IDL= 0.01 ug/l;MDL= 0.20 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Heptachlor epoxide: LLE ECD (IDL= 0.01 ug/l;MDL= 0.10 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Hexachlorocyclopentadiene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=20.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Hexachlorocyclopentadiene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.340 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Kepone: LLE ECD (IDL= 0.01 ug/l;MDL= 2.00 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-14
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
Methoxychlor: LLE ECD				
(IDL= 0.01 ug/l;MDL= 0.09 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Toxaphene: LLE ECD				
(IDL= 0.01 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
2,3,7,8-Tetrachlorodibenzo-p-dioxin: Base neut. LLE GCMS				
(IDL=10.0 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Tricresolphosphate: Base neut. LLE GCMS				
(IDL=50.0 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
2,4-D: LLE (w/ methyl.) ECD				
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)				
No. of Samples			1	1
No. Detected			0	0
No. Above MDL			0	0
Arithmetic Mean			ND	ND
Median Value			ND	ND
90% Less Than			ND	ND
Maximum Value			ND	ND

TABLE G-4-14
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
2,4,5-T: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)				
No. of Samples			1	1
No. Detected			0	0
No. Above MDL			0	0
Arithmetic Mean			ND	ND
Median Value			ND	ND
90% Less Than			ND	ND
Maximum Value			ND	ND
2,4,5-TP: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.5 ug/l)				
No. of Samples			1	1
No. Detected			0	0
No. Above MDL			0	0
Arithmetic Mean			ND	ND
Median Value			ND	ND
90% Less Than			ND	ND
Maximum Value			ND	ND

TABLE G-4-15
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
N-Nitrosodimethylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL=10.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
N-Nitrosodiphenylamine: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 5.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
N-Nitrosodipropylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1-Bromo-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1-Bromo-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-15
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1-Chloro-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 8.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1-Chloro-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloroethylvinylether: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2-Chloroethylvinylether: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1,1'-(Methylenebis(oxy))-bis-2-chloroethane: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND

TABLE G-4-15
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
1,1'-Oxybis(2-chloroethane): Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 4.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
1,1'-Oxybis(2-chloroethane): CLS GCMS				
(IDL= 0.005 ug/l;MDL= 0.080 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
2,2'-Oxybis(2-chloropropane): Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Tetrahydrofuran: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Acetone: purge & trap GCMS				
(IDL= 0.5 ug/l;MDL= 0.5 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G-4-15
PROCESS PERFORMANCE -- 1 FEBRUARY 1983 TO 16 MARCH 1983 (PHASE IIB)
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	Blended Influent	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
2-Butanone: purge & trap GCMS				
(IDL= 0.1 ug/l;MDL= 1.0 ug/l)				
No. of Samples	3	3	3	3
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Isophorone: Base neut. LLE GCMS				
(IDL= 0.5 ug/l;MDL= 3.0 ug/l)				
No. of Samples		1	1	1
No. Detected		0	0	0
No. Above MDL		0	0	0
Arithmetic Mean		ND	ND	ND
Median Value		ND	ND	ND
90% Less Than		ND	ND	ND
Maximum Value		ND	ND	ND
Geosmin: CLS GCMS				
(IDL= 0.0005 ug/l;MDL= 0.0500 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND
Methylisoborneol: CLS GCMS				
(IDL= 0.0005 ug/l;MDL= 0.0400 ug/l)				
No. of Samples	2	3	2	2
No. Detected	0	0	0	0
No. Above MDL	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND
Median Value	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND

TABLE G - 4 - 16
PROCESS PERFORMANCE: 2 FEBRUARY 1983 - 16 MARCH 1983 (PHASE IIB)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
VOLATILE ORGANIC ANALYSIS (PURGE AND TRAP, GC/MS)
(Concentrations reported in ug/L)

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
MISCELLANEOUS ORGANIC CHEMICALS				
Ethers				
1,1'-Oxybisethane				
No. of Times Detected / No. of Samples	1 / 3	0 / 3	1 / 3	0 / 3
Range of Concentrations	0.1	ND	0.1	ND

TABLE G - 4 - 17
PROCESS PERFORMANCE : 2 FEBRUARY 1983 - MARCH 16 1983 (PHASE IIA)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
ACID EXTRACTION (W / METHYLATION) AND GC/MS

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water

(No secondary compounds were identified by this technique at any process site.)

TABLE G - 4 - 18
PROCESS PERFORMANCE : 2 FEBRUARY 1983 - 16 MARCH 1983 (PHASE IIB)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
BASE/NEUTRAL EXTRACTION AND GC/MS

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water

(No secondary compounds were identified by this technique at any process site.)

TABLE G - 4 - 19
PROCESS PERFORMANCE : 2 FEBRUARY 1983 - 15 MARCH 1983 (PHASE IIB)
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS

	Blend Tank	Dual Media Filter Effluent	Final Carbon Column Effluent	EEWTP Finished Water
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)				
Alkylbenzenes				
1,3-Dimethyl-5-(1-methylethyl)benzene				
No. of Times Detected / No. of Samples	0 / 2	0 / 3	1 / 2	0 / 2
Range of Concentrations	ND	ND	.005	ND
2,4-Dimethyl-1-(1-methylpropyl)benzene				
No. of Times Detected / No. of Samples	0 / 2	0 / 3	1 / 2	0 / 2
Range of Concentrations	ND	ND	.018	ND
(1,1-Dimethylpropyl)benzene				
No. of Times Detected / No. of Samples	0 / 2	0 / 3	1 / 2	0 / 2
Range of Concentrations	ND	ND	.003	ND
1,2,4,5-Tetramethylbenzene				
No. of Times Detected / No. of Samples	0 / 2	0 / 3	1 / 2	0 / 2
Range of Concentrations	ND	ND	.011	ND
Naphthalenes				
1-Methylnaphthalene				
No. of Times Detected / No. of Samples	0 / 2	0 / 3	1 / 2	0 / 2
Range of Concentrations	ND	ND	.027	ND
2-Methylnaphthalene				
No. of Times Detected / No. of Samples	0 / 2	0 / 3	1 / 2	0 / 2
Range of Concentrations	ND	ND	.035	ND
1,2,3,4-Tetrahydro-6-methylnaphthalene				
No. of Times Detected / No. of Samples	0 / 2	0 / 3	1 / 2	0 / 2
Range of Concentrations	ND	ND	.013	ND
Other multiring aromatics				
2,3-Dihydro-4,6-dimethylindene				
No. of Times Detected / No. of Samples	0 / 2	0 / 3	1 / 2	0 / 2
Range of Concentrations	ND	ND	.007	ND
MISCELLANEOUS ORGANIC CHEMICALS				
Aldehydes				
Decanal				
No. of Times Detected / No. of Samples	1 / 2	1 / 3	0 / 2	0 / 2
Range of Concentrations	.038	.120	ND	ND
Dodecanal				
No. of Times Detected / No. of Samples	1 / 2	1 / 3	0 / 2	0 / 2
Range of Concentrations	.260	.670	ND	ND
Alkanes				
C12-Alkanes				
No. of Times Detected / No. of Samples	1 / 2	0 / 3	0 / 2	0 / 2
Range of Concentrations	0.037	ND	ND	ND

TABLE G-4-20
PROCESS PERFORMANCE
2 FEBRUARY 1983 TO 16 MARCH 1983
AMES TEST

(Monitoring for the Ames Test was discontinued after Phase IIA)

APPENDIX H

CHARACTERIZATION OF FINISHED WATERS

This appendix provides statistical summary tables for the three monitored off-site plants (WTP1, WTP2, and WTP3) as well as for the EEWTP finished water during each of the main phases of operation. The off-site data summarized here was collected over a twenty-three month period between 16 March 1981 and 1 February 1983. EEWTP finished water data was collected over the appropriate dates for the given phases, as described for Appendices G-1 to G-3.

The data are organized by parameter group, as indicated below:

H-1 Physical/Aesthetic Parameters

H-2 Asbestos Fibers

- a. Concentration
- b. Characterization

H-3 Major Cations, Anions and Nutrients

H-4 Trace Metals

H-5 Radiological Parameters

H-6 Microbiological Parameters

H-7 Viruses

H-8 Parasites

H-9 Organic Surrogate Parameters - TOC and TOX

H-10 Synthetic Organic Chemicals - Halogenated Alkanes

H-11 Synthetic Organic Chemicals - Halogenated Alkenes

H-12 Synthetic Organic Chemicals - Aromatic Hydrocarbons (Non-Halogenated)

H-13 Synthetic Organic Chemicals - Halogenated Aromatics

H-14 Synthetic Organic Chemicals - Pesticides/Herbicides

H-15 Synthetic Organic Chemicals - Miscellaneous Quantified Organic Chemicals

H-16 Organic chemicals Tentatively Identified by Volatile Organic Analysis (Purge and Trap GC/MS)

H-17 Organic Chemicals Tentatively Identified by Acid Extraction (w/Methylation) and GC/MS

It should be noted that not all of the analyses were conducted for the entire twelve month period. Exceptions are noted on the tables, either with specific text, or with one of the following symbols either at the location heading or next to the "No. of Samples":

*	Analysis terminated on 1 December 1981
**	Analysis initiated on 1 December 1981
+	Analysis terminated on 16 March 1982
++	Analysis initiated on 16 March 1982

All data reported here are from 24-hour composite samples unless noted otherwise (next to the parameter name). In some cases, a negligible number of composite samples were missed, and grab samples taken in their place are included with the data analysis.

The statistical results reported in the tables of this appendix have been calculated using the techniques described in the Main Volume of the report, Chapter 5. These have been summarized in Table 5.1-2 of that chapter. As discussed in Chapter 5, the geometric mean and spread factor have only been calculated in cases where 15 percent or more of the samples were quantified. Otherwise, results for these statistical parameters have been left blank.

Additional symbols utilized in the tables of this appendix are described below:

ND:	Not Detected. Arithmetic mean is reported as ND if <u>all</u> sample concentrations were reported as "ND."
NQ:	Not Quantifiable. Arithmetic Mean is reported as NQ if all sample concentrations were either "ND" or "NQ," but all were not "ND." (Organic chemicals only.)
Not Calculated:	Geometric mean is reported as "Not Calculated" if there were greater than 15 percent of the samples quantified but geometric mean calculation was still not feasible. This only occurred in cases where all quantified results had the same numerical value.

TABLE H-1
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
PHYSICAL/AESTHETIC PARAMETERS

	EEWTP Finished Water			WTP 1	WTP 2	WTP 3
	Phase IA	Phase IB	Phase IIA	Finished Water	Finished Water	Finished Water
Temperature, deg. C [in-situ readings]						
No. of Readings	365	112	199	627	619	596
Arithmetic Mean	18.1	19.0	20.1	16.4	15.6	16.7
Standard Deviation	6.9	5.2	6.2	8.5	7.4	8.7
Median Value	18.0	20.5	19.7	17.0	17.5	18.0
Minimum Value	7.0	9.5	9.0	1.0	1.2	1.0
Maximum Value	29.0	26.5	29.8	30.0	25.5	31.0
pH [grab samples]						
No. of Readings	2158	1333	1079	6[illegible]5	619	595
Arithmetic Mean	6.8	7.6	7.4	7.6	7.8	7.6
Standard Deviation	0.5	0.2	0.1	0.2	0.4	0.3
Geometric Mean	6.8	7.5	7.4	7.6	7.8	7.6
Spread Factor	1.08	1.03	1.00	1.03	1.05	1.04
Median Value	6.8	7.6	7.4	7.6	7.8	7.5
Minimum Value	5.3	5.7	6.9	7.0	6.7	6.7
Maximum Value	9.2	8.8	7.8	8.3	9.2	9.0
Dissolved Oxygen [grab samples] (MDL=0.15 mg/l)						
No. of Readings	355	111	178			
Arithmetic Mean	8.1	8.3	8.5			
Standard Deviation	1.4	1.2	2.5			
Geometric Mean	7.9	8.2	7.7			
Spread Factor	1.20	1.15	1.75			
Median Value	8.1	8.0	9.2			
Minimum Value	4.9	6.2	0.6			
Maximum Value	11.3	11.5	11.4			
Turbidity [grab samples] (MDL= 0.05 NTU)						
No. of Samples	3914	668	1079	554	619	594
No. Above MDL	3910	668	1076	554	619	590
Arithmetic Mean	0.12	0.11	0.07	0.41	0.24	0.22
Standard Deviation	0.07	0.05	0.04	0.32	0.14	0.15
Geometric Mean	0.11	0.10	0.06	0.33	0.22	0.19
Spread Factor	1.66	1.46	1.47	1.94	1.58	1.74
Median Value	0.10	0.10	0.05	0.32	0.20	0.18
90% Less Than	0.20	0.15	0.10	0.76	0.40	0.38
Apparent Color (MDL= 3 color units)						
No. of Samples	204	14	21	230	50 (**)	48 (**
No. Above MDL	99	12	21	98	49	44
Arithmetic Mean	3.4	5.1	11.4	3.8	8.8	8.9
Standard Deviation	2.8	1.9	4.1	3.8	4.9	5.2
Geometric Mean	2.9	4.9	10.5	2.5	7.5	7.5
Spread Factor	1.97	1.43	1.55	2.55	1.80	1.89
Median Value	ND	5	15	ND	8	8
90% Less Than	7	7	15	8	15	15

TABLE H-1
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
PHYSICAL/AESTHETIC PARAMETERS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
MBAS (MDL= 0.03 mg/l)						
No. of Samples	267	4	6	258	24 (**)	22 (**)
No. Above MDL	165	4	3	215	17	20
Arithmetic Mean	0.033	0.035	0.022	0.040	0.030	0.035
Standard Deviation	0.022	0.006	0.008	0.021	0.013	0.010
Geometric Mean	0.032	0.035	Not	0.038	0.032	0.036
Spread Factor	1.57	1.15	Calculated	1.46	1.30	1.24
Median Value	0.03	0.03	ND	0.04	0.03	0.03
90% Less Than	0.05	0.04	0.03	0.06	0.04	0.05
Taste (MDL= 2 Taste Units)						
No. of Samples	249 (*)			226 (*)		
No. Above MDL	248			226		
Arithmetic Mean	29.0			23.6		
Standard Deviation	25.7			20.9		
Geometric Mean	20.6			18.0		
Spread Factor	2.28			1.98		
Median Value	17			12		
90% Less Than	50			50		
Odor (MDL= 1 TON)						
No. of Samples	267	23	46	96 (*)	87 (*)	83 (*)
No. Above MDL	267	23	44	96	87	82
Arithmetic Mean	22.3	11.5	13.4	16.8	12.9	12.5
Standard Deviation	20.6	4.9	22.1	15.0	12.5	21.7
Geometric Mean	16.7	10.4	5.2	13.1	9.6	8.5
Spread Factor	2.09	1.58	4.05	1.99	2.09	2.39
Median Value	17	12	4	12	8	8
90% Less Than	50	17	40	25	17	17
Free Chlorine [grab samples] (MDL= 0.1 mg/l-Cl)						
No. of Samples	2438	738	1150	391		
No. Above MDL	2422	738	944	391		
Arithmetic Mean	1.60	2.42	0.20	2.11		
Standard Deviation	0.64	0.67	0.42	0.25		
Geometric Mean	1.39	2.14	0.12	2.10		
Spread Factor	1.96	2.01	2.15	1.13		
Median Value	1.6	2.5	0.1	2.1		
90% Less Than	2.5	2.8	0.3	2.4		
Total Chlorine [grab samples] (MDL= 0.1 mg/l-Cl)						
No. of Samples	2434	736	1195	349		
No. Above MDL	2433	736	1194	349		
Arithmetic Mean	1.98	2.83	2.98	2.31		
Standard Deviation	0.65	0.77	0.42	0.28		
Geometric Mean	1.89	2.76	2.98	2.30		
Spread Factor	1.35	1.22	1.26	1.12		
Median Value	1.8	2.7	3.1	2.3		
90% Less Than	2.8	3.1	3.3	2.7		

TABLE H-2 (A)
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
ASBESTOS FIBER CONCENTRATION

CHRYSOTILE FIBERS

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Summary Data:						
Total Number of Samples	48	16	24	65	63	64
Total Volume Filtered, Liters (VT)	2.452	0.804	1.214	4.382	2.776	3.207
Equivalent Volume Examined, Liters (V)	0.0003597	0.0001175	0.0001775	0.0006498	0.0004109	0.000471
Percent Filter Area Examined (V/VT * 100)	0.01467	0.01462	0.01462	0.01483	0.01480	0.01469
Chrysotile Fiber Results:						
Total Fibers Counted (N)	9	2	2	90	21	61
Max. Concentration, MFL	0.585	0.274	0.263	3.443	0.622	2.326
Min. Concentration, MFL	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Median Concentration, MFL	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
90 Percentile Concentration, MFL	N.D.	N.D.	N.D.	0.410	0.183	0.274
Average Concentration (N/V), MFL	0.025	0.017	0.011	0.139	0.051	0.129
Minimum Detection Limits						
Highest, MFL	0.146	0.137	0.137	0.262	0.274	0.207
Lowest, MFL	0.066	0.132	0.129	0.065	0.131	0.087

AMPHIBOLE FIBERS

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Summary Data:						
Total Number of Samples	48	16	24	65	63	64
Total Volume Filtered, Liters (VT)	2.452	0.804	1.214	4.382	2.776	3.207
Equivalent Volume Examined, Liters (V)	0.0003597	0.0001175	0.0001775	0.0006498	0.0004109	0.00047[illegible]
Percent Filter Area Examined (V/VT * 100)	0.01467	0.01462	0.01462	0.01483	0.01480	0.01469
Amphibole Fiber Results:						
Total Fibers Counted (N)	0	0	0	4	1	8
Max. Concentration, MFL	N.D.	N.D.	N.D.	0.547	0.131	0.918
Min. Concentration, MFL	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Median Concentration, MFL	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
90 Percentile Concentration, MFL	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Average Concentration (N/V), MFL	N.D.	N.D.	N.D.	0.006	0.002	0.017
Minimum Detection Limits						
Highest, MFL	0.146	0.137	0.137	0.262	0.274	0.207
Lowest, MFL	0.066	0.132	0.129	0.065	0.131	0.087

TABLE H-2 (B)
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
ASBESTOS FIBER CHARACTERIZATION

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Chrysotile Fibers:						
Number of Fibers Examined *	0	0	0	45	0	32
Length Distribution, Fibers/Samples						
0.0 - 0.49 um	0/0	0/0	0/0	5/2	0/0	3/3
0.50 - 0.9 um	0/0	0/0	0/0	13/3	0/0	14/3
1.0 - 1.4 um	0/0	0/0	0/0	10/4	0/0	11/2
1.5 - 1.9 um	0/0	0/0	0/0	2/1	0/0	1/1
2.0 - 2.4 um	0/0	0/0	0/0	3/1	0/0	0/0
> 2.5 um	0/0	0/0	0/0	12/2	0/0	3/2
Width Distribution, Fibers/Samples						
0.00 - 0.04 um	0/0	0/0	0/0	3/2	0/0	1/1
0.05 - 0.09 um	0/0	0/0	0/0	34/4	0/0	24/3
0.10 - 0.14 um	0/0	0/0	0/0	6/3	0/0	6/1
0.15 - 0.19 um	0/0	0/0	0/0	2/1	0/0	1/1
0.20 - 0.24 um	0/0	0/0	0/0	0/0	0/0	0/0
> 2.5 um	0/0	0/0	0/0	0/0	0/0	0/0
Aspect Ratio Distribution, Fibers/Samples						
0.0 - 9.0	0/0	0/0	0/0	11/3	0/0	11/3
10.0 - 19.9	0/0	0/0	0/0	15/4	0/0	13/3
20.0 - 29.9	0/0	0/0	0/0	3/1	0/0	5/2
30.0 - 39.9	0/0	0/0	0/0	3/2	0/0	0/0
40.0 - 49.9	0/0	0/0	0/0	2/1	0/0	0/0
> 50.0	0/0	0/0	0/0	11/3	0/0	3/2
Amphibole Fibers:						
Number of Fibers Examined *	0	0	0	0	0	7
Length Distribution, Fibers/Samples						
0.0 - 0.49 um	0/0	0/0	0/0	0/0	0/0	0/0
0.50 - 0.9 um	0/0	0/0	0/0	0/0	0/0	2/1
1.0 - 1.4 um	0/0	0/0	0/0	0/0	0/0	5/1
1.5 - 1.9 um	0/0	0/0	0/0	0/0	0/0	0/0
2.0 - 2.4 um	0/0	0/0	0/0	0/0	0/0	0/0
> 2.5 um	0/0	0/0	0/0	0/0	0/0	0/0
Width Distribution, Fibers/Samples						
0.00 - 0.04 um	0/0	0/0	0/0	0/0	0/0	0/0
0.05 - 0.09 um	0/0	0/0	0/0	0/0	0/0	0/0
0.10 - 0.14 um	0/0	0/0	0/0	0/0	0/0	3/1
0.15 - 0.19 um	0/0	0/0	0/0	0/0	0/0	4/1
0.20 - 0.24 um	0/0	0/0	0/0	0/0	0/0	0/0
> 2.5 um	0/0	0/0	0/0	0/0	0/0	0/0
Aspect Ratio Distribution, Fibers/Samples						
0.0 - 9.0	0/0	0/0	0/0	0/0	0/0	5/1
10.0 - 19.9	0/0	0/0	0/0	0/0	0/0	2/1
20.0 - 29.9	0/0	0/0	0/0	0/0	0/0	0/0
30.0 - 39.9	0/0	0/0	0/0	0/0	0/0	0/0
40.0 - 49.9	0/0	0/0	0/0	0/0	0/0	0/0
> 50.0	0/0	0/0	0/0	0/0	0/0	0/0

* Only those fibers from samples with 5 or more fibers were used.

TABLE H-3
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
MAJOR CATIONS, ANIONS, AND NUTRIENTS

	EEWTP Finished Water Phase IA	Phase IB	Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Total Dissolved Solids (TDS): by evaporation (MDL=10.0 mg/l)						
No. of Samples	189 (*)			173 (*)		
No. Above MDL	189			173		
Arithmetic Mean	278.5			198.8		
Standard Deviation	51.4			51.2		
Geometric Mean	273.7			192.4		
Spread Factor	1.21			1.29		
Median Value	273			195		
90% Less Than	349			266		
Total Dissolved Solids (TDS): by addition (MDL= 1 mg/l)						
No. of Samples	27 (**)	28	53	103 (**)	102 (**)	96 (**)
No. Above MDL	27	28	53	103	102	96
Arithmetic Mean	301.4	235.1	304.2	186.4	129.4	175.4
Standard Deviation	35.1	39.6	42.6	38.7	20.6	34.6
Geometric Mean	299.4	231.1	301.5	182.4	127.8	172.2
Spread Factor	1.12	1.22	1.14	1.23	1.16	1.21
Median Value	293	246	303	188	123	168
90% Less Than	353	268	347	238	160	231
Electroconductivity (MDL= 0.1 umho/cm)						
No. of Samples	201	28	53	270	107 (**)	105 (**)
No. Above MDL	201	28	53	270	107	105
Arithmetic Mean	470.4	437.4	581.0	331.5	240.3	338.5
Standard Deviation	71.8	81.8	63.3	66.9	42.3	63.5
Geometric Mean	464.8	427.7	577.7	324.8	236.8	332.7
Spread Factor	1.17	1.26	1.11	1.22	1.18	1.20
Median Value	470.0	460.0	580.0	335.0	230.0	330.0
90% Less Than	570.0	520.0	635.0	425.0	310.0	438.0
Calcium (MDL= 0.2 mg/l)						
No. of Samples	280	32	55	345	344	334
No. Above MDL	280	32	55	345	344	334
Arithmetic Mean	48.93	49.9	70.75	41.32	25.60	40.32
Standard Deviation	9.83	7.42	19.69	8.92	3.81	9.16
Geometric Mean	47.95	49.27	68.67	40.32	25.34	39.26
Spread Factor	1.22	1.18	1.27	1.25	1.15	1.26
Median Value	47.1	51.7	65.9	42.3	25.0	40.1
90% Less Than	63.8	56.8	87.4	53.4	30.5	51.9
Hardness: by addition (Ca+Mg, as CaCO3) (MDL= 1.0 mg/l-CaCO3)						
No. of Samples	280	32	55	344	344	333
No. Above MDL	280	32	55	343	344	333
Arithmetic Mean	155.4	152.3	197.2	135.3	81.9	132.2
Standard Deviation	30.8	22.4	42.7	31.0	10.2	30.0
Geometric Mean	150.7	150.5	193.7	130.4	81.3	128.8
Spread Factor	1.39	1.18	1.20	1.42	1.13	1.26
Median Value	153	156	190	138	80	133
90% Less Than	199	174	227	174	95	170

TABLE H-3
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Magnesium (MDL= 0.1 mg/l)						
No. of Samples	279	32	55	343	344	333
No. Above MDL	279	32	55	343	344	333
Arithmetic Mean	8.19	6.73	4.98	7.90	4.37	7.66
Standard Deviation	1.72	1.06	2.39	2.18	0.55	2.07
Geometric Mean	8.01	6.64	4.26	7.60	4.33	7.38
Spread Factor	1.24	1.19	1.86	1.32	1.14	1.31
Median Value	8.0	6.8	5.4	7.5	4.4	7.4
90% Less Than	10.5	7.9	8.2	11.0	5.0	10.7
Potassium (MDL= 0.3 mg/l)						
No. of Samples	280	32	55	345	344	333
No. Above MDL	280	32	55	344	344	333
Arithmetic Mean	6.16	4.63	6.25	2.56	2.96	2.65
Standard Deviation	1.10	1.14	0.68	0.60	1.37	0.66
Geometric Mean	6.04	4.43	6.21	2.48	2.85	2.56
Spread Factor	1.22	1.41	1.13	1.31	1.27	1.29
Median Value	6.1	5.0	6.3	2.6	2.9	2.7
90% Less Than	7.4	5.6	7.0	3.2	3.6	3.4
Sodium (MDL= 0.1 mg/l)						
No. of Samples	280	32	55	345	344	334
No. Above MDL	280	32	55	345	344	334
Arithmetic Mean	29.90	23.17	31.87	12.89	12.08	12.58
Standard Deviation	6.47	5.94	4.28	6.16	4.09	5.81
Geometric Mean	29.20	22.00	31.57	11.53	11.48	11.37
Spread Factor	1.25	1.44	1.15	1.60	1.38	1.57
Median Value	29.8	24.9	33.3	11.4	11.9	11.3
90% Less Than	37.4	28.2	36.2	22.6	14.5	20.7
Alkalinity (MDL= 2.7 mg/l-CaCO3)						
No. of Samples	282	28	53	341	107 (**)	105 (**)
No. Above MDL	282	28	53	341	107	105
Arithmetic Mean	42.29	61.79	101.32	78.02	42.72	66.44
Standard Deviation	19.44	11.91	39.48	18.40	10.75	20.48
Geometric Mean	37.69	60.65	96.09	75.73	41.30	63.20
Spread Factor	1.64	1.22	1.36	1.28	1.31	1.38
Median Value	37.6	61.0	96.0	80.0	41.6	67.0
90% Less Than	71.0	76.0	131.0	103.0	59.0	97.0
Bromide (MDL= 0.003 mg/l)						
No. of Samples	282	28	53	341	107 (**)	105 (**)
No. Above MDL	115	5	49	66	54	15
Arithmetic Mean	0.0113	0.0044	0.0392	0.0060	0.0072	0.0027
Standard Deviation	0.0168	0.0096	0.0440	0.0117	0.0108	0.0032
Geometric Mean	0.0022	0.0004	0.0224	0.0003	0.0032	
Spread Factor	8.81	10.49	3.22	19.10	3.76	
Median Value	ND	ND	0.031	ND	0.003	ND
90% Less Than	0.035	0.014	0.080	0.020	0.016	0.008

TABLE H-3
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Chloride (MDL= 0.1 mg/l)						
No. of Samples	284	28	53	341	107 (**)	105 (**)
No. Above MDL	284	28	53	341	107	105
Arithmetic Mean	47.73	43.39	61.26	21.21	22.48	35.66
Standard Deviation	11.44	13.71	7.33	6.89	8.47	9.76
Geometric Mean	46.37	39.68	60.78	20.11	21.14	34.36
Spread Factor	1.28	1.65	1.14	1.39	1.41	1.32
Median Value	48.0	47.0	63.0	20.0	20.0	36.0
90% Less Than	60.5	54.0	68.0	30.0	38.0	47.0
Cyanide, Total (MDL= 0.005 mg/l)						
No. of Samples	283	32	53	346	109 (**)	105 (**)
No. Above MDL	75	0	8	13	25	16
Arithmetic Mean	0.0054	ND	0.0034	0.0030	0.0047	0.0035
Standard Deviation	0.0098		0.0023	0.0040	0.0070	0.0035
Geometric Mean	0.0024		0.0021		0.0022	0.0019
Spread Factor	3.32		2.34		3.14	2.55
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	0.011	ND	0.006	ND	0.009	0.007
Fluoride (MDL= 0.10 mg/l)						
No. of Samples	283	28	53	340	107 (**)	105 (**)
No. Above MDL	277	25	53	340	107	104
Arithmetic Mean	0.32	0.25	0.48	0.92	0.95	0.90
Standard Deviation	0.12	0.10	0.11	0.19	0.11	0.15
Geometric Mean	0.30	0.23	0.47	0.90	0.94	0.88
Spread Factor	1.44	1.56	1.26	1.19	1.12	1.32
Median Value	0.3	0.3	0.5	0.9	0.9	0.9
90% Less Than	0.4	0.4	0.6	1.0	1.1	1.0
Iodide (MDL= 0.002 mg/l)						
No. of Samples	252			232		
No. Above MDL	218			205		
Arithmetic Mean	0.0036			0.0034		
Standard Deviation	0.0019			0.0017		
Geometric Mean	0.0032			0.0031		
Spread Factor	1.66			1.57		
Median Value	0.003			0.003		
90% Less Than	0.006			0.006		
Nitrogen, Nitrite + Nitrate (MDL= 0.02 mg/l-N)						
No. of Samples	285	28	53	341	105 (**)	104 (**)
No. Above MDL	284	28	53	327	89	100
Arithmetic Mean	7.36	5.86	7.94	1.40	0.87	1.61
Standard Deviation	2.13	2.33	1.63	0.68	0.64	0.73
Geometric Mean	6.87	5.09	7.71	1.09	0.44	1.28
Spread Factor	1.65	1.87	1.31	2.72	5.60	2.68
Median Value	7.6	6.9	8.3	1.4	0.9	1.6
90% Less Than	9.3	8.0	9.6	2.2	1.7	2.5

TABLE H-3
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
MAJOR CATIONS, ANIONS, AND NUTRIENTS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Nitrogen, Ammonia (MDL= 0.02 mg/l-N)						
No. of Samples	285	28	53	341	105 (**)	103 (**)
No. Above MDL	65	9	48	70	103	49
Arithmetic Mean	0.069	0.046	0.731	0.026	0.493	0.096
Standard Deviation	0.211	0.123	0.413	0.063	0.218	0.256
Geometric Mean	0.002	0.008	0.491	0.005	0.435	0.019
Spread Factor	15.96	5.86	3.60	6.03	1.83	6.99
Median Value	ND	ND	0.80	ND	0.45	ND
90% Less Than	0.06	0.07	1.20	0.05	0.76	0.20
Nitrogen, Total Kjeldahl (MDL= 0.2 mg/l-N)						
No. of Samples	30	28	53	105	106 (**)	104 (**)
No. Above MDL	21	5	52	61	103	65
Arithmetic Mean	0.35	0.18	1.06	0.37	0.79	0.43
Standard Deviation	0.27	0.26	0.62	0.40	0.43	0.47
Geometric Mean	0.29	0.05	0.89	0.25	0.70	0.27
Spread Factor	2.02	4.24	1.88	2.54	1.66	2.66
Median Value	0.3	ND	1.0	0.3	0.7	0.3
90% Less Than	0.8	0.25	1.8	0.9	1.2	1.0
Ortho Phosphate (MDL= 0.01 mg/l-P)						
No. of Samples	285	28	53	340	106 (**)	104 (**)
No. Above MDL	27	4	9	34	12	8
Arithmetic Mean	0.013	0.031	0.016	0.012	0.014	0.008
Standard Deviation	0.053	0.113	0.041	0.040	0.037	0.013
Geometric Mean			0.001			
Spread Factor			14.54			
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	0.04	0.04	ND	0.03	ND
Silica (MDL= 0.2 mg/l)						
No. of Samples	283	28	53	337	108 (**)	104 (**)
No. Above MDL	283	28	53	337	108	104
Arithmetic Mean	5.77	6.23	4.97	4.38	7.40	4.48
Standard Deviation	1.88	1.78	1.41	2.38	2.19	1.91
Geometric Mean	5.43	5.97	4.80	3.54	6.94	4.02
Spread Factor	1.45	1.35	1.31	2.08	1.50	1.64
Median Value	5.7	6.0	4.7	4.3	7.5	4.6
90% Less Than	8.4	8.8	6.5	7.6	9.6	6.5
Sulfate (MDL= 0.6 mg/l)						
No. of Samples	284	28	53	341	107 (**)	105 (**)
No. Above MDL	284	28	53	341	107	105
Arithmetic Mean	92.70	60.05	55.62	53.40	30.08	32.66
Standard Deviation	17.37	7.78	10.65	16.83	3.83	10.67
Geometric Mean	91.10	59.52	54.61	51.04	29.83	31.01
Spread Factor	1.20	1.15	1.21	1.34	1.14	1.38
Median Value	90.0	62.0	55.4	47.1	30.0	30.0
90% Less Than	118.9	69.0	71.0	82.0	34.9	49.0

TABLE H-4
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Aluminum (MDL= 0.003 mg/l)						
No. of Samples	278	32	55	343	340	333
No. Above MDL	225	32	45	322	332	317
Arithmetic Mean	0.0708	0.2081	0.0203	0.0943	0.2094	0.0741
Standard Deviation	0.3139	0.1801	0.0198	0.2233	0.1262	0.0589
Geometric Mean	0.0184	0.1601	0.0128	0.0548	0.1654	0.0534
Spread Factor	4.84	2.14	3.02	3.00	2.42	2.65
Median Value	0.020	0.150	0.020	0.070	0.190	0.070
90% Less Than	0.090	0.320	0.040	0.140	0.360	0.130
Antimony (MDL= 0.0003 mg/l)						
No. of Samples	277			254 (+)	256 (+)	251 (+)
No. Above MDL	132			63	47	53
Arithmetic Mean	0.00070			0.00049	0.00040	0.00043
Standard Deviation	0.00181			0.00158	0.00102	0.00144
Geometric Mean	0.00025			0.00009	0.00005	0.00008
Spread Factor	3.52			5.16	7.02	5.23
Median Value	ND			ND	ND	ND
90% Less Than	0.0010			0.0006	0.0006	0.0005
Arsenic (MDL= 0.0002 mg/l)						
No. of Samples	278	32	55	343	343	332
No. Above MDL	147	28	48	264	245	226
Arithmetic Mean	0.00094	0.00058	0.00044	0.00079	0.00057	0.00054
Standard Deviation	0.00328	0.00036	0.00030	0.00206	0.00115	0.00136
Geometric Mean	0.00020	0.00050	0.00037	0.00039	0.00032	0.00030
Spread Factor	4.65	1.85	1.82	2.81	2.64	2.62
Median Value	0.0002	0.0005	0.0003	0.0004	0.0003	0.0003
90% Less Than	0.0009	0.0010	0.0009	0.0011	0.0009	0.0009
Barium (MDL= 0.002 mg/l)						
No. of Samples	276	33	55	340	339	330
No. Above MDL	265	33	55	328	332	323
Arithmetic Mean	0.0238	0.0253	0.0172	0.0344	0.0270	0.0285
Standard Deviation	0.0080	0.0062	0.0048	0.0113	0.0074	0.0097
Geometric Mean	0.0215	0.0246	0.0166	0.0307	0.0254	0.0260
Spread Factor	1.78	1.28	1.31	1.88	1.56	1.69
Median Value	0.024	0.024	0.016	0.035	0.027	0.029
90% Less Than	0.032	0.032	0.024	0.047	0.034	0.041
Beryllium (MDL= 0.0008 mg/l)						
No. of Samples	277			255 (+)	255 (+)	252 (+)
No. Above MDL	0			2	1	0
Arithmetic Mean	ND			0.00531	0.00118	ND
Standard Deviation				0.07825	0.01250	
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND

TABLE H-4
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Boron (MDL= 0.0040 mg/l)						
No. of Samples	278	32	55	343	343	332
No. Above MDL	270	32	54	294	326	292
Arithmetic Mean	0.04222	0.04720	0.04247	0.01601	0.02986	0.01780
Standard Deviation	0.02618	0.01747	0.01591	0.01508	0.04759	0.01386
Geometric Mean	0.03378	0.04370	0.03877	0.01240	0.02253	0.01422
Spread Factor	2.18	1.51	1.63	2.15	2.13	2.09
Median Value	0.0442	0.0449	0.0431	0.0150	0.0273	0.0170
90% Less Than	0.0647	0.0690	0.0636	0.0250	0.0430	0.0275
Cadmium: ICAP (MDL= 0.0008 mg/l)						
No. of Samples	252 (*)			235 (*)	236 (*)	229 (*)
No. Above MDL	33			21	23	19
Arithmetic Mean	0.00052			0.00049	0.00060	0.00047
Standard Deviation	0.00037			0.00042	0.00148	0.00028
Median Value	ND			ND	ND	ND
90% Less Than	0.0009			ND	ND	ND
Cadmium: furnace AAS (MDL= 0.0002 mg/l)						
No. of Samples	26 (**)	32	55	107 (**)	105 (**)	102 (**)
No. Above MDL	2	6	2	9	6	9
Arithmetic Mean	0.00013	0.00022	0.00011	0.00012	0.00012	0.00020
Standard Deviation	0.00011	0.00029	0.00003	0.00011	0.00011	0.00073
Geometric Mean		0.00004				
Spread Factor		6.62				
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	0.0006	ND	ND	ND	ND
Chromium: ICAP (MDL= 0.003 mg/l)						
No. of Samples	252 (*)			234 (*)	237 (*)	229 (*)
No. Above MDL	6			62	9	20
Arithmetic Mean	0.0016			0.0023	0.0016	0.0018
Standard Deviation	0.0005			0.0016	0.0008	0.0009
Geometric Mean				0.0020		
Spread Factor				1.87		
Median Value	ND			ND	ND	ND
90% Less Than	ND			0.005	ND	ND
Chromium: furnace AAS (MDL= 0.0002 mg/l)						
No. of Samples	26 (**)	32	55	108 (**)	105 (**)	102 (**)
No. Above MDL	17	29	53	98	88	94
Arithmetic Mean	0.00100	0.00131	0.00178	0.00248	0.00118	0.00259
Standard Deviation	0.00096	0.00101	0.00165	0.00207	0.00105	0.00321
Geometric Mean	0.00047	0.00095	0.00123	0.00170	0.00077	0.00160
Spread Factor	4.30	2.42	2.50	2.79	2.83	2.93
Median Value	0.0007	0.0009	0.0012	0.0021	0.0009	0.0017
90% Less Than	0.0024	0.0025	0.0038	0.0044	0.0025	0.0052

TABLE H-4
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Cobalt: ICAP						
(MDL= 0.003 mg/l)						
No. of Samples	252 (*)			235 (*)	238 (*)	229 (*)
No. Above MDL	5			4	5	6
Arithmetic Mean	0.0016			0.0016	0.0016	0.0016
Standard Deviation	0.0005			0.0008	0.0004	0.0004
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Cobalt: furnace AAS						
(MDL= 0.0001 mg/l)				(+)	(+)	(+)
No. of Samples	25 (**)			20 (**)	18 (**)	22 (**)
No. Above MDL	20			15	13	20
Arithmetic Mean	0.00055			0.00039	0.00027	0.00043
Standard Deviation	0.00057			0.00034	0.00020	0.00040
Geometric Mean	0.00035			0.00027	0.00019	0.00032
Spread Factor	2.84			2.66	2.52	2.18
Median Value	0.0005			0.0004	0.0002	0.0004
90% Less Than	0.0008			0.0005	0.0005	0.0006
Copper: ICAP						
(MDL= 0.0008 mg/l)						
No. of Samples	252 (*)			235 (*)	238 (*)	230 (*)
No. Above MDL	174			178	218	171
Arithmetic Mean	0.00328			0.00280	0.00625	0.00320
Standard Deviation	0.00880			0.00256	0.00405	0.00367
Geometric Mean	0.00158			0.00190	0.00472	0.00197
Spread Factor	3.21			2.63	2.40	2.90
Median Value	0.0019			0.0024	0.0056	0.0026
90% Less Than	0.0060			0.0058	0.0115	0.0061
Copper: flame AAS						
(MDL= 0.0012 mg/l)						
No. of Samples	26 (**)	32	55	108 (**)	105 (**)	103 (**)
No. Above MDL	20	21	22	79	92	80
Arithmetic Mean	0.00440	0.00138	0.00145	0.00240	0.00396	0.00378
Standard Deviation	0.00596	0.00074	0.00139	0.00217	0.00309	0.01289
Geometric Mean	0.00249	0.00137	0.00096	0.00188	0.00306	0.00211
Spread Factor	2.88	1.50	2.55	2.08	2.12	2.29
Median Value	0.0023	0.0013	ND	0.0019	0.0032	0.0022
90% Less Than	0.0094	0.0024	0.0031	0.0046	0.0081	0.0048
Iron						
(MDL= 0.003 mg/l)						
No. of Samples	278	32	55	341	340	333
No. Above MDL	239	28	38	292	304	319
Arithmetic Mean	0.0977	0.0348	0.0158	0.0530	0.0418	0.0830
Standard Deviation	0.4566	0.0642	0.0209	0.1970	0.0725	0.1565
Geometric Mean	0.0244	0.0167	0.0071	0.0203	0.0228	0.0468
Spread Factor	4.34	3.34	4.05	3.89	3.28	2.95
Median Value	0.032	0.017	0.007	0.026	0.027	0.051
90% Less Than	0.084	0.056	0.038	0.070	0.092	0.140

TABLE H-4
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Lead (MDL= 0.0003 mg/l)						
No. of Samples	278	32	54	342	341	331
No. Above MDL	152	7	13	166	164	162
Arithmetic Mean	0.00092	0.00023	0.00031	0.00068	0.00067	0.00080
Standard Deviation	0.00247	0.00017	0.00036	0.00144	0.00138	0.00231
Geometric Mean	0.00033	0.00016	0.00012	0.00028	0.00028	0.00028
Spread Factor	3.74	2.24	3.71	3.61	3.77	3.97
Median Value	0.0003	ND	ND	ND	ND	ND
90% Less Than	0.0016	0.0006	0.0007	0.0012	0.0016	0.0015
Lithium: ICAP (MDL= 0.0010 mg/l)						
No. of Samples	250 (*)			232 (*)	238 (*)	230 (*)
No. Above MDL	242			210	83	210
Arithmetic Mean	0.00497			0.00349	0.00091	0.00304
Standard Deviation	0.00536			0.00389	0.00077	0.00162
Geometric Mean	0.00406			0.00266	0.00076	0.00261
Spread Factor	1.80			2.03	1.94	1.84
Median Value	0.0042			0.0031	ND	0.0031
90% Less Than	0.0070			0.0053	0.0018	0.0050
Lithium: flame AAS (MDL= 0.0004 mg/l)						
No. of Samples	26 (**)	32	55	108 (**)	105 (**)	103 (**)
No. Above MDL	24	32	55	106	78	101
Arithmetic Mean	0.00651	0.00735	0.00569	0.00339	0.00114	0.00371
Standard Deviation	0.00841	0.01663	0.00098	0.00331	0.00158	0.00427
Geometric Mean	0.00414	0.00451	0.00561	0.00290	0.00070	0.00305
Spread Factor	2.69	2.00	1.18	1.70	2.58	1.79
Median Value	0.0046	0.0042	0.0058	0.0031	0.0007	0.0032
90% Less Than	0.0069	0.0067	0.0069	0.0043	0.0023	0.0054
Manganese (MDL= 0.0010 mg/l)						
No. of Samples	278	32	55	342	342	332
No. Above MDL	278	27	17	269	330	312
Arithmetic Mean	0.05176	0.00921	0.00208	0.00334	0.01071	0.01200
Standard Deviation	0.07259	0.01229	0.00366	0.00401	0.01036	0.03320
Geometric Mean	0.03040	0.00456	0.00039	0.00218	0.00747	0.00510
Spread Factor	2.99	3.63	7.12	2.53	2.49	3.21
Median Value	0.0380	0.0059	ND	0.0022	0.0088	0.0044
90% Less Than	0.1093	0.0203	0.0081	0.0069	0.0200	0.0200
Mercury (MDL= 0.00027 mg/l)						
No. of Samples	278	32	55	331	339	329
No. Above MDL	103	11	10	225	84	102
Arithmetic Mean	0.00032	0.00026	0.00022	0.00074	0.00025	0.00032
Standard Deviation	0.00041	0.00022	0.00022	0.00072	0.00032	0.00052
Geometric Mean	0.00020	0.00020	0.00009	0.00048	0.00014	0.00015
Spread Factor	2.71	2.17	3.32	2.78	2.78	3.20
Median Value	ND	ND	ND	0.0005	ND	ND
90% Less Than	0.0007	0.0005	0.0004	0.0016	0.0005	0.0006

TABLE H-4
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Molybdenum						
(MDL= 0.002 mg/l)						
No. of Samples	275			252 (+)	254 (+)	249 (+)
No. Above MDL	24			21	9	13
Arithmetic Mean	0.0012			0.0012	0.0011	0.0011
Standard Deviation	0.0008			0.0006	0.0006	0.0008
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Nickel						
(MDL= 0.0010 mg/l)						
No. of Samples	275	32	55	340	339	330
No. Above MDL	217	18	30	232	81	125
Arithmetic Mean	0.00317	0.00341	0.00166	0.00311	0.00114	0.00150
Standard Deviation	0.00265	0.00482	0.00136	0.00279	0.00161	0.00189
Geometric Mean	0.00237	0.00145	0.00121	0.00204	0.00036	0.00072
Spread Factor	2.29	4.20	2.40	2.83	4.47	3.51
Median Value	0.0028	0.0020	0.0013	0.0027	ND	ND
90% Less Than	0.0058	0.0084	0.0039	0.0061	0.0028	0.0035
Selenium						
(MDL= 0.0002 mg/l)						
No. of Samples	278	32	55	343	343	331
No. Above MDL	193	7	39	229	224	242
Arithmetic Mean	0.00115	0.00021	0.00072	0.00105	0.00116	0.00106
Standard Deviation	0.00138	0.00035	0.00058	0.00145	0.00261	0.00143
Geometric Mean	0.00051	0.00006	0.00046	0.00044	0.00042	0.00050
Spread Factor	4.33	4.31	2.97	4.45	4.59	3.75
Median Value	0.0007	ND	0.0006	0.0005	0.0005	0.0005
90% Less Than	0.0026	0.0004	0.0015	0.0027	0.0025	0.0026
Silver: flame AAS						
(MDL= 0.0008 mg/l)						
No. of Samples	252 (*)			235 (*)	238 (*)	229 (*)
No. Above MDL	10			7	15	15
Arithmetic Mean	0.00044			0.00044	0.00045	0.00052
Standard Deviation	0.00032			0.00038	0.00036	0.00082
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Silver: furnace AAS						
(MDL= 0.0002 mg/l)						
No. of Samples	26 (**)	32	55	108 (**)	105 (**)	102 (**)
No. Above MDL	0	2	2	8	4	14
Arithmetic Mean	ND	0.00012	0.00010	0.00013	0.00011	0.00019
Standard Deviation		0.00009	0.00002	0.00015	0.00004	0.00038
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	0.0003

TABLE H-4
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Thallium (MDL= 0.0009 mg/l)						
No. of Samples	277			255 (+)	256 (+)	251 (+)
No. Above MDL	6			1	0	2
Arithmetic Mean	0.00047			0.00045	ND	0.00046
Standard Deviation	0.00016			0.00003		0.00012
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Tin (MDL= 0.0040 mg/l)						
No. of Samples	275			252 (+)	254 (+)	249 (+)
No. Above MDL	58			63	38	51
Arithmetic Mean	0.00412			0.00363	0.00282	0.00328
Standard Deviation	0.00769			0.00438	0.00278	0.00502
Geometric Mean	0.00128			0.00200	0.00239	0.00178
Spread Factor	4.11			2.75	1.59	2.62
Median Value	ND			ND	ND	ND
90% Less Than	0.0076			0.0074	0.0051	0.0058
Titanium (MDL= 0.0020 mg/l)						
No. of Samples	276	32	55	340	339	329
No. Above MDL	4	1	2	8	11	28
Arithmetic Mean	0.0011	0.0010	0.0011	0.0011	0.0013	0.0016
Standard Deviation	0.0014	0.0002	0.0003	0.0009	0.0029	0.0035
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Vanadium (MDL= 0.0020 mg/l)						
No. of Samples	276	32	55	339	341	329
No. Above MDL	155	5	38	168	104	110
Arithmetic Mean	0.00501	0.00138	0.00277	0.00405	0.00261	0.00236
Standard Deviation	0.00696	0.00122	0.00157	0.00722	0.00443	0.00297
Geometric Mean	0.00248	0.00082	0.00266	0.00199	0.00101	0.00126
Spread Factor	3.42	2.37	1.58	3.23	3.76	3.01
Median Value	0.0024	ND	0.0029	ND	ND	ND
90% Less Than	0.0112	0.0022	0.0043	0.0076	0.0054	0.0057
Zinc: ICAP (MDL= 0.0020 mg/l)						
No. of Samples	251 (*)			234 (*)	238 (*)	228 (*)
No. Above MDL	251			169	151	155
Arithmetic Mean	0.06503			0.00678	0.00523	0.00592
Standard Deviation	0.02761			0.01006	0.00640	0.00986
Geometric Mean	0.05894			0.00384	0.00303	0.00332
Spread Factor	1.58			2.92	2.95	2.85
Median Value	0.0624			0.0038	0.0035	0.0036
90% Less Than	0.1007			0.0141	0.0121	0.0106

TABLE H-4
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
TRACE METALS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Zinc: flame AAS (MDL= 0.0012 mg/l)						
No. of Samples	26 (**)	32	55	108 (**)	105 (**)	103 (**)
No. Above MDL	26	32	55	90	75	71
Arithmetic Mean	0.03033	0.01656	0.01000	0.00900	0.00365	0.00475
Standard Deviation	0.03462	0.02943	0.00682	0.01896	0.00577	0.01266
Geometric Mean	0.02183	0.00926	0.00830	0.00300	0.00211	0.00219
Spread Factor	2.04	2.49	1.85	3.66	2.79	3.14
Median Value	0.0180	0.0077	0.0087	0.0026	0.0023	0.0023
90% Less Than	0.0646	0.0286	0.0180	0.0160	0.0067	0.0080

TABLE H-5
CHARACTERIZATION OF FINISHED WATERS
RADIOLOGICAL PARAMETERS

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Gross Alpha (MDL= 0.1 pCi/l)						
No. of Samples	45	7	12	68	66	64
No. Above MDL	22	2	0	27	26	35
Arithmetic Mean	0.28	0.24	ND	0.16	0.19	0.29
Standard Deviation	0.48	0.34		0.18	0.25	0.31
Geometric Mean	0.10	0.03		0.07	0.07	0.12
Spread Factor	4.54	11.69		3.55	4.44	4.35
Median Value	ND	ND	ND	ND	ND	0.1
90% Less Than	0.6	0.9	ND	0.5	0.5	0.8
Gross Alpha 2s Error (MDL= 0.1 pCi/l)						
No. of Samples	38	7	12	60	59	57
No. Above MDL	38	7	12	60	59	57
Arithmetic Mean	0.56	0.40	0.41	0.37	0.31	0.43
Standard Deviation	0.22	0.20	0.20	0.16	0.15	0.17
Geometric Mean	0.51	0.36	0.35	0.34	0.28	0.40
Spread Factor	1.49	1.61	1.86	1.58	1.53	1.48
Median Value	0.5	0.3	0.4	0.4	0.3	0.4
90% Less Than	0.9	0.7	0.6	0.5	0.5	0.6
Gross Beta (MDL= 0.1 pCi/l)						
No. of Samples	46	7	12	68	67	65
No. Above MDL	46	7	12	52	58	52
Arithmetic Mean	6.82	5.06	5.68	2.80	3.29	3.16
Standard Deviation	3.59	0.69	2.05	2.54	1.93	2.78
Geometric Mean	5.93	5.02	5.27	1.11	1.98	1.42
Spread Factor	1.74	1.14	1.52	7.13	4.38	6.24
Median Value	5.9	5.2	5.9	2.6	3.2	3.1
90% Less Than	12.0	5.9	7.6	5.4	5.8	5.6
Gross Beta 2s Error (MDL= 0.1 pCi/l)						
No. of Samples	39	7	12	60	60	58
No. Above MDL	39	7	12	60	60	58
Arithmetic Mean	2.14	1.16	1.20	1.36	1.23	1.32
Standard Deviation	1.02	0.05	0.22	0.73	0.65	0.72
Geometric Mean	1.92	1.16	1.18	1.19	1.11	1.16
Spread Factor	1.61	1.04	1.22	1.66	1.53	1.62
Median Value	2.0	1.2	1.2	1.0	1.0	1.0
90% Less Than	3.8	1.2	1.4	2.6	2.3	2.5
Strontium-90 (Note: Analyzed only for selected dates where Gross Beta + 2 sigma > 8 pCi/L at plant sites) (MDL= 0.2 pCi/l)						
No. of Samples	11		1	3	5	2
No. Above MDL	7		1	1	3	0
Arithmetic Mean	1.11		0.90	0.37	0.46	ND
Standard Deviation	0.83			0.46	0.34	
Geometric Mean	0.55			0.11	0.33	
Spread Factor	4.67			5.95	2.64	
Median Value	1.5		0.9	ND	0.6	ND
90% Less Than	1.9		0.9	0.9	0.8	ND

TABLE H-5
CHARACTERIZATION OF FINISHED WATERS
RADIOLOGICAL PARAMETERS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Strontium-90 2s error sites)	(Note: Analyzed only for selected dates where Gross Beta + 2 sigma > 8 pCi/L at plant					
(MDL= 0.2 pCi/l)						
No. of Samples	11		1	3	5	2
No. Above MDL	11		1	3	5	2
Arithmetic Mean	0.38		0.30	0.37	0.46	0.40
Standard Deviation	0.12			0.15	0.09	0.14
Geometric Mean	0.37		0.30	0.34	0.45	0.39
Spread Factor	1.42		1.00	1.48	1.18	1.29
Median Value	0.4		0.3	0.4	0.4	0.3
90% Less Than	0.5		0.3	0.5	0.6	0.5
Tritium						
(MDL=1000 pCi/l)						
No. of Samples		2	6	9 (++)	8 (++)	9 (++)
No. Above MDL		0	0	0	0	0
Arithmetic Mean		ND	ND	ND	ND	ND
Median Value		ND	ND	ND	ND	ND
90% Less Than		ND	ND	ND	ND	ND

TABLE H-6
CHARACTERIZATION OF FINISHED WATERS
MICROBIOLOGICAL PARAMETERS

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Total Coliform (confirmed): 1000,100,10 ml volumes [grab samples] (MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)						
No. of Samples	255	68	119	448	283	282
No. of Positives	181	19	11	9	18	23
No. of TNTC	0	0	0	0	0	0
Geometric Mean	0.0314	0.0084				
Spread Factor	3.22	3.35				
Median Value	0.020	ND	ND	ND	ND	ND
90% Less Than	0.140	0.040	ND	ND	ND	ND
Maximum Value	0.490	0.230	0.080	0.050	0.230	0.130
Total Coliform (completed): 1000,100,10 ml volumes [grab samples] (MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)						
No. of Samples	88	69	102	290	251	251
No. of Positives	36	14	9	6	8	10
No. of TNTC	0	0	0	0	0	0
Geometric Mean	0.0135	0.0065				
Spread Factor	3.13	3.24				
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	0.068	0.020	ND	ND	ND	ND
Maximum Value	0.200	0.230	0.080	0.050	0.230	0.050
Fecal Coliform (confirmed): 1000,100,10 ml volumes [grab samples] (MDL=0.018 MPN/100 ml;UQL=24 MPN/100 ml)				(*)	(*)	(*)
No. of Samples	187 (*)	71	114	375 (++)	216 (++)	213 (++)
No. of Positives	25	3	1	1	1	2
No. of TNTC	0	0	0	0	0	0
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	0.020	ND	ND	ND	ND	ND
Maximum Value	0.080	0.020	0.020	0.020	0.020	0.020
Standard Plate Count: 1 ml volume [grab samples] (MDL=1.0 colonies/ml)						
No. of Samples	259	75	112	432	274	271
No. of Positives	5[illegible]	16	29	81	116	125
Geometric Mean	0.2	0.4	0.4	0.2	0.7	0.8
Spread Factor	8.46	3.40	4.29	7.55	3.88	5.23
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	2	2	2	2	4	7
Maximum Value	300	14	29	340	78	83
Salmonella: 1000 ml volume [grab samples] (MDL=0.022 MPN/100 ml;UQL= 0.16 MPN/100 ml)						
No. of Samples	10	3	7	21	15	15
No. of Positives	0	0	0	0	1	0
No. of TNTC	0	0	0	0	0	0
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	0.022	ND

TABLE H-6
CHARACTERIZATION OF FINISHED WATERS
MICROBIOLOGICAL PARAMETERS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Endotoxin [grab samples] (MDL=0.006 ng/ml)						
No. of Samples	9	1		10	3 (**)	4 (**
No. Above MDL	9	1		10	3	4
Arithmetic Mean	4.9878	2.5000		3.3640	3.0000	10.235
Standard Deviation	4.7600			1.7686	2.0952	4.851
Geometric Mean	2.8688	2.500		2.9877	2.5146	9.378
Spread Factor	3.16			1.63	1.83	1.52
Median Value	5.000	2.500		2.500	2.500	6.240
90% Less Than	12.500	2.500		6.200	5.300	16.000

TABLE H-7
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
VIRUS ASSAY

Sampling Date	Volume Filtered (Gallons)	Cell Line	Lower Detection Limit (MPNCU/Gallon)	Concentration (MPNCU/Gallon)
		EEWTP Finished Water (Phase IA)		
28-Apr-1981	1000.0	BGM cell line	.003	N.D.
		RD cell line	.003	N.D.
29-May-1981	1000.0	BGM cell line	.003	N.D.
		RD cell line	.003	N.D.
8-Jul-1981	1000.0	BGM cell line	.007	N.D.
		MA104 cell line	.009	N.D.
14-Jul-1981	1000.0	BGM cell line	.008	N.D.
		MA104 cell line	.008	N.D.
27-Aug-1981	960.0	BGM cell line	.006	N.D.
		MA104 cell line	.005	N.D.
7-Oct-1981	1000.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
27-Oct-1981	1000.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
10-Dec-1981	705.0	BGM cell line	.051	N.D.
		MA104 cell line	.051	N.D.
22-Jan-1982	1000.0	BGM cell line	.002	N.D.
		MA104 cell line	.002	N.D.
10-Feb-1982	686.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
10-Mar-1982	954.0	BGM cell line	.006	N.D.
		MA104 cell line	.008	N.D.
		EEWTP Finished Water (Phase IB)		
17-Mar-1982	1007.0	BGM cell line	.006	N.D.
		MA104 cell line	.008	N.D.
24-Mar-1982	1053.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
1-Apr-1982	1201.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
7-Apr-1982	1173.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
14-Apr-1982	1000.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
16-Apr-1982	1000.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
23-Apr-1982	781.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
5-May-1982	970.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
12-May-1982	1001.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
21-May-1982	1023.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
26-May-1982	1068.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
2-Jun-1982	1000.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
8-Jun-1982	952.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
23-Jun-1982	1005.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
30-Jun-1982	905.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
		EEWTP Finished Water (Phase IIA)		
28-Jul-1982	330.0	BGM cell line	.009	N.D.
		MA104 cell line	.009	N.D.
6-Aug-1982	710.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
9-Aug-1982	112.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
11-Aug-1982	803.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
18-Aug-1982	634.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
1-Sep-1982	780.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
17-Sep-1982	320.0	BGM cell line	.011	N.D.
		MA104 cell line	.011	N.D.
23-Sep-1982	1007.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.

TABLE H-7
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
VIRUS ASSAY
(Continued)

Sampling Date	Volume Filtered (Gallons)	Cell Line	Lower Detection Limit (MPNCU/Gallon)	Concentration (MPNCU/Gallon)
		EEWTP Finished Water (Phase IIA, Continued)		
30-Sep-1982	900.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
6-Oct-1982	825.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
13-Oct-1982	840.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
21-Oct-1982	750.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
27-Oct-1982	980.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
3-Nov-1982	1040.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
10-Nov-1982	936.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
22-Nov-1982	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
24-Nov-1982	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
1-Dec-1982	1000.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
8-Dec-1982	1000.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
15-Dec-1982	1000.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
22-Dec-1982	1000.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
27-Dec-1982	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
3-Jan-1983	980.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
12-Jan-1983	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
18-Jan-1983	998.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
19-Jan-1983	1102.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
26-Jan-1983	1085.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
2-Feb-1983	1032.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
3-Feb-1983	1005.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
9-Feb-1983	945.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.

TABLE H-7
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
VIRUS ASSAY
(Continued)

Sampling Date	Volume Filtered (Gallons)	Cell Line	Lower Detection Limit (MPNCU/Gallon)	Concentration (MPNCU/Gallon)
Water Treatment Plant 1 Finished Water				
1-May-1981	1000.0	BGM cell line	.003	N.D.
		RD cell line	.003	N.D.
27-May-1981	1000.0	BGM cell line	.003	N.D.
		RD cell line	.003	N.D.
28-Jun-1981	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
22-Jul-1981	1000.0	BGM cell line	.010	N.D.
		MA104 cell line	.008	N.D.
2-Sep-1981	1000.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
16-Oct-1981	1000.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
29-Oct-1981	600.0	BGM cell line	.008	N.D.
		MA104 cell line	.008	N.D.
20-Nov-1981	629.0	BGM cell line	.008	N.D.
		MA104 cell line	.009	N.D.
3-Dec-1981	800.0	BGM cell line	.009	N.D.
		MA104 cell line	.008	N.D.
8-Jan-1982	546.0	BGM cell line	.006	N.D.
		MA104 cell line	.004	N.D.
3-Feb-1982	500.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
26-Mar-1982	877.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
2-Apr-1982	851.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
6-May-1982	1013.9	BGM cell line	.008	N.D.
		MA104 cell line	.008	N.D.
13-May-1982	890.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
10-Jun-1982	607.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
8-Jul-1982	751.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
26-Aug-1982	330.0	BGM cell line	.010	N.D.
		MA104 cell line	.010	N.D.
15-Sep-1982	360.0	BGM cell line	.009	N.D.
		MA104 cell line	.009	N.D.
11-Nov-1982	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
7-Dec-1982	880.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
16-Dec-1982	1000.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
13-Jan-1983	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
28-Jan-1983	740.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.

TABLE H-7
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
VIRUS ASSAY
(Continued)

Sampling Date	Volume Filtered (Gallons)	Cell Line	Lower Detection Limit (MPNCU/Gallon)	Concentration (MPNCU/Gallon)
Water Treatment Plant 2 Finished Water				
29-Apr-1981	1000.0	BGM cell line	.003	N.D.
		RD cell line	.003	N.D.
21-May-1981	1000.0	BGM cell line	.002	N.D.
		RD cell line	.002	N.D.
24-Jun-1981	1000.0	BGM cell line	.003	N.D.
		RD cell line	.003	N.D.
20-Jul-1981	1000.0	BGM cell line	.007	N.D.
		MA104 cell line	.006	N.D.
16-Sep-1981	775.0	BGM cell line	.011	N.D.
		MA104 cell line	.006	N.D.
14-Oct-1981	762.0	BGM cell line	.008	N.D.
		MA104 cell line	.008	N.D.
28-Oct-1981	766.0	BGM cell line	.009	N.D.
		MA104 cell line	.009	N.D.
25-Nov-1981	511.0	BGM cell line	.013	N.D.
		MA104 cell line	.011	N.D.
4-Dec-1981	500.0	BGM cell line	.013	N.D.
		MA104 cell line	.013	N.D.
9-Jan-1982	500.0	BGM cell line	.010	N.D.
		MA104 cell line	.007	N.D.
4-Feb-1982	516.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
4-Mar-1982	832.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
9-Apr-1982	953.0	BGM cell line	.006	N.D.
		MA104 cell line	.006	N.D.
4-Jun-1982	975.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
21-Jul-1982	670.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
14-Sep-1982	740.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
28-Oct-1982	525.0	BGM cell line	.007	N.D.
		MA104 cell line	.007	N.D.
18-Nov-1982	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
6-Dec-1982	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
23-Dec-1982	1000.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
6-Jan-1983	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
27-Jan-1983	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
4-Feb-1983	1000.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.

TABLE H-7
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
VIRUS ASSAY
(Continued)

Sampling Date	Volume Filtered (Gallons)	Cell Line	Lower Detection Limit (MPNCU/Gallon)	Concentration (MPNCU/Gallon)
		Water Treatment Plant 3 Finished Water		
30-Apr-1981	760.0	BGM cell line	.004	N.D.
		RD cell line	.004	N.D.
22-May-1981	1000.0	BGM cell line	.003	N.D.
		RD cell line	.003	N.D.
30-Jun-1981	1000.0	BGM cell line	.003	N.D.
		RD cell line	.003	N.D.
21-Jul-1981	843.0	BGM cell line	.008	N.D.
		MA104 cell line	.008	N.D.
1-Sep-1981	600.0	BGM cell line	.014	N.D.
		MA104 cell line	.012	N.D.
15-Oct-1981	500.0	BGM cell line	.011	N.D.
		MA104 cell line	.010	N.D.
2-Nov-1981	1003.0	BGM cell line	.008	N.D.
		MA104 cell line	.008	N.D.
30-Dec-1981	500.0	BGM cell line	.008	N.D.
		MA104 cell line	.005	N.D.
13-Jan-1982	500.0	BGM cell line	.013	N.D.
		MA104 cell line	.013	N.D.
5-Feb-1982	500.0	BGM cell line	.004	N.D.
		MA104 cell line	.005	N.D.
5-Mar-1982	521.0	BGM cell line	.012	N.D.
		MA104 cell line	.012	N.D.
15-Apr-1982	221.0	BGM cell line	.020	N.D.
		MA104 cell line	.020	N.D.
31-May-1982	1000.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
24-Jun-1982	760.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
23-Jul-1982	415.0	BGM cell line	.009	N.D.
		MA104 cell line	.009	N.D.
16-Sep-1982	735.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
4-Nov-1982	720.0	BGM cell line	.005	N.D.
		MA104 cell line	.005	N.D.
2-Dec-1982	1000.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.
8-Dec-1982	260.0	BGM cell line	.012	N.D.
		MA104 cell line	.012	N.D.
20-Jan-1983	900.0	BGM cell line	.004	N.D.
		MA104 cell line	.004	N.D.
9-Feb-1983	945.0	BGM cell line	.003	N.D.
		MA104 cell line	.003	N.D.

TABLE H-8
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 15 FEBRUARY 1983
PARASITES

EEWTP Finished Water
(Phase IA)

Samples Assayed: 15
Total Volume Filtered (Gallons): 10965.0
Total Equivalent Volume (Gallons): 2132.1

Samples with Unknown Volume: 3
Samples with Unknown Equiv. Volume: 5

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

EEWTP Finished Water
(Phase IB)

Samples Assayed: 4
Total Volume Filtered (Gallons): 1617.0
Total Equivalent Volume (Gallons): 337.1

Samples with Unknown Volume: 0
Samples with Unknown Equiv. Volume: 0

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

EEWTP Finished Water
(Phase IIA)

Samples Assayed: 7
Total Volume Filtered (Gallons): 2262.0
Total Equivalent Volume (Gallons): 1063.5

Samples with Unknown Volume: 0
Samples with Unknown Equiv. Volume: 0

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

Water Treatment Plant 1 Finished Water

Samples Assayed: 19
Total Volume Filtered (Gallons): 10222.0
Total Equivalent Volume (Gallons): 1970.0

Samples with Unknown Volume: 2
Samples with Unknown Equiv. Volume: 4

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

TABLE H-8
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 15 FEBRUARY 1983
PARASITES
(Continued)

Water Treatment Plant 2 Finished Water

Samples Assayed:	22
Total Volume Filtered (Gallons):	8275.0
Total Equivalent Volume (Gallons):	2607.0
Samples with Unknown Volume:	2
Samples with Unknown Equiv. Volume:	4

Parasite Name	Number Observed
Giardia	5 (1 sample: 20-Jul-82)
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

Water Treatment Plant 3 Finished Water

Samples Assayed:	22
Total Volume Filtered (Gallons):	9819.0
Total Equivalent Volume (Gallons):	2422.4
Samples with Unknown Volume:	2
Samples with Unknown Equiv. Volume:	3

Parasite Name	Number Observed
Giardia	N.D.
Entamoeba histolytica	N.D.
Acanthamoeba	N.D.
Naegleria gruberi	N.D.
Ascaris	N.D.
Hookworm	N.D.
Trichuris trichiura	N.D.

TABLE H-9
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
ORGANIC SURROGATE PARAMETERS -- TOC AND TOX

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Total Organic Carbon: DC80 (MDL=0.06 mg/l-C)						
No. of Samples	294	41	97	388	407	383
No. Above MDL	294	41	97	388	407	383
Arithmetic Mean	1.59	1.30	0.75	2.33	3.83	2.51
Standard Deviation	0.60	0.39	0.33	0.57	0.85	0.59
Geometric Mean	1.43	1.23	0.67	2.27	3.76	2.44
Spread Factor	1.65	1.44	1.59	1.25	1.21	1.25
Median Value	1.7	1.3	0.7	2.3	3.7	2.4
90% Less Than	2.2	1.8	1.2	2.9	4.7	3.3
Total Organic Carbon: DC80 [grab samples] (MDL=0.06 mg/l-C)						
No. of Samples	387	107	191			
No. Above MDL	387	107	191			
Arithmetic Mean	1.90	1.59	1.31			
Standard Deviation	0.61	0.52	0.42			
Geometric Mean	1.79	1.49	1.24			
Spread Factor	1.46	1.48	1.41			
Median Value	2.0	1.6	1.3			
90% Less Than	2.6	2.1	1.9			
Total Organic Halogen (MDL=3.9 ug/l-Cl)						
No. of Samples	299	41	97	423	428	405
No. Above MDL	295	40	94	423	428	405
Arithmetic Mean	97.62	39.00	36.37	275.06	291.30	266.73
Standard Deviation	58.42	18.93	27.34	79.56	82.44	110.33
Geometric Mean	77.90	32.28	27.28	262.21	280.26	246.28
Spread Factor	2.17	2.08	2.24	1.38	1.32	1.49
Median Value	90.0	40.0	30.0	280.0	285.0	240.0
90% Less Than	195.0	60.0	75.0	365.0	395.0	410.0

TABLE H-10
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Chloroform: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	98	41	99	227	230	209
No. Detected	95	36	96	227	230	209
No. Above MDL	93	34	81	227	230	209
Arithmetic Mean	7.30	2.35	1.23	54.68	57.39	44.27
Standard Deviation	11.02	1.95	1.04	22.15	24.83	29.55
Geometric Mean	4.06	1.47	0.77	50.02	52.34	36.62
Spread Factor	3.27	3.22	2.90	1.56	1.54	1.91
Median Value	5.0	2.1	0.8	54.0	52.0	38.0
90% Less Than	11.0	5.2	2.8	80.0	95.0	77.0
Chloroform: LLE ECD [grab samples]						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	62					
No. Detected	60					
No. Above MDL	58					
Arithmetic Mean	3.67					
Standard Deviation	5.44					
Geometric Mean	2.12					
Spread Factor	2.85					
Median Value	2.5					
90% Less Than	5.0					
Chloroform: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	38	40	40
No. Detected	18	8	8	38	40	40
No. Above MDL	18	7	8	38	40	40
Arithmetic Mean	7.89	1.47	1.13	37.42	37.30	30.09
Standard Deviation	4.79	0.96	1.44	22.03	20.83	12.37
Geometric Mean	6.36	1.08	0.37	32.96	33.37	26.90
Spread Factor	2.07	2.55	5.85	1.62	1.56	1.72
Median Value	7.7	1.3	0.3	32.0	28.0	28.0
90% Less Than	13.0	2.2	3.4	58.0	60.0	49.0
Maximum Value	21.0	3.2	4.0	120.0	120.0	57.0
Bromodichloromethane: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	99	41	99	227	230	209
No. Detected	98	40	96	227	230	209
No. Above MDL	92	34	34	227	230	208
Arithmetic Mean	3.60	2.36	0.35	11.95	7.93	9.55
Standard Deviation	3.50	1.66	0.33	3.99	3.00	3.84
Geometric Mean	2.17	1.56	0.20	11.21	7.45	8.59
Spread Factor	3.06	3.11	2.59	1.46	1.46	1.71
Median Value	2.5	2.5	NQ	12.0	7.4	9.4
90% Less Than	8.7	3.6	0.9	16.0	12.0	15.0
Bromodichloromethane: LLE ECD [grab samples]						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	62					
No. Detected	61					
No. Above MDL	57					
Arithmetic Mean	2.39					
Standard Deviation	2.64					
Geometric Mean	1.49					
Spread Factor	2.79					
Median Value	1.7					
90% Less Than	4.5					

TABLE H-10
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Bromodichloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	18	7	3	39	40	40
No. Above MDL	18	7	3	39	40	40
Arithmetic Mean	6.57	1.56	0.19	12.40	7.32	10.18
Standard Deviation	5.65	0.85	0.30	6.68	3.21	5.73
Geometric Mean	4.60	1.19	0.06	10.40	6.61	8.72
Spread Factor	2.36	2.56	5.21	1.96	1.59	1.76
Median Value	3.5	1.7	ND	10.0	6.3	8.4
90% Less Than	13.0	2.6	0.8	25.0	12.0	17.0
Maximum Value	21.0	2.6	0.9	27.0	14.0	27.0
Bromodichloromethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.070 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	9	6	9	32	24	28
No. Above MDL	9	6	3	31	24	28
Arithmetic Mean	2.0656	0.9683	0.3167	6.1186	4.8088	4.7200
Standard Deviation	1.0721	0.9636	0.8058	6.8500	4.5773	3.9156
Geometric Mean	1.8110	0.6668	0.0166	3.8302	3.1389	3.1359
Spread Factor	1.69	2.37	15.30	3.16	3.04	2.64
Median Value	1.900	0.510	NQ	4.100	4.300	3.400
90% Less Than	3.600	2.800	0.270	10.000	7.100	11.000
Maximum Value	3.600	2.800	2.600	39.000	23.000	14.000
Dibromochloromethane: LLE ECD (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	99	41	99	227	230	209
No. Detected	94	40	69	227	229	209
No. Above MDL	91	36	32	227	229	207
Arithmetic Mean	2.13	3.30	0.28	1.90	0.88	1.80
Standard Deviation	1.84	2.36	0.40	1.08	0.63	1.36
Geometric Mean	1.35	2.06	0.10	1.69	0.73	1.46
Spread Factor	2.99	3.55	3.87	1.62	1.80	1.95
Median Value	1.6	3.9	NQ	1.8	0.7	1.6
90% Less Than	5.3	5.5	0.8	2.8	1.7	3.1
Dibromochloromethane: LLE ECD [grab samples] (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	62					
No. Detected	61					
No. Above MDL	56					
Arithmetic Mean	1.78					
Standard Deviation	1.60					
Geometric Mean	1.21					
Spread Factor	2.66					
Median Value	1.6					
90% Less Than	3.0					
Dibromochloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	17	7	2	38	35	39
No. Above MDL	16	7	1	36	19	34
Arithmetic Mean	3.86	1.71	0.09	1.49	0.50	1.22
Standard Deviation	3.38	1.12	0.11	1.31	0.38	1.05
Geometric Mean	2.22	1.30		1.10	0.40	0.92
Spread Factor	3.44	2.43		2.16	2.12	2.17
Median Value	2.7	1.8	ND	1.0	NQ	1.0
90% Less Than	9.9	3.0	NQ	3.3	1.0	2.4
Maximum Value	11.0	3.0	0.4	6.6	1.4	5.6

TABLE H-10
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Dibromochloromethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	9	6	10	32	24	28
No. Above MDL	9	6	2	31	24	28
Arithmetic Mean	2.7556	4.0717	0.0755	1.7683	0.5874	1.2121
Standard Deviation	2.6773	5.4814	0.1367	1.2830	0.3619	1.3413
Geometric Mean	2.1327	1.7877	0.0075	1.2351	0.4658	0.7710
Spread Factor	1.88	4.45	10.02	2.75	2.14	2.63
Median Value	1.700	2.400	NQ	1.400	0.560	0.710
90% Less Than	9.500	15.000	0.091	3.600	0.950	2.600
Maximum Value	9.500	15.000	0.460	5.000	1.600	6.800
Bromoform: LLE ECD (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	99	41	99	227	230	209
No. Detected	57	29	21	35	13	35
No. Above MDL	50	29	17	13	6	12
Arithmetic Mean	0.42	1.20	0.15	0.09	0.06	0.13
Standard Deviation	0.52	1.09	0.26	0.15	0.04	0.45
Geometric Mean	0.22	0.64	0.04			
Spread Factor	3.49	4.06	5.03			
Median Value	0.2	1.1	ND	ND	ND	ND
90% Less Than	1.1	2.1	0.4	NQ	ND	NQ
Bromoform: LLE ECD [grab samples] (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	62					
No. Detected	49					
No. Above MDL	37					
Arithmetic Mean	0.42					
Standard Deviation	0.41					
Geometric Mean	0.27					
Spread Factor	2.78					
Median Value	0.3					
90% Less Than	0.9					
Bromoform: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	12	5	0	3	0	4
No. Above MDL	9	4	0	0	0	1
Arithmetic Mean	0.59	0.47	ND	NQ	ND	0.09
Standard Deviation	0.57	0.39				0.12
Geometric Mean	0.58	0.62				
Spread Factor	1.85	1.36				
Median Value	NQ	NQ	ND	ND	ND	ND
90% Less Than	1.8	0.9	ND	ND	ND	ND
Maximum Value	1.9	0.9	ND	NQ	ND	0.6
Bromoform: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.040 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	9	6	6	24	4	16
No. Above MDL	9	5	2	7	0	4
Arithmetic Mean	0.6582	1.2604	0.1841	0.0274	NQ	0.0204
Standard Deviation	0.7533	2.2744	0.5328	0.0266		0.0223
Geometric Mean	0.3399	0.2623	0.0019	0.0217		
Spread Factor	3.43	6.94	35.72	2.20		
Median Value	0.350	0.140	NQ	NQ	ND	NQ
90% Less Than	2.200	5.800	0.041	0.048	NQ	0.061
Maximum Value	2.200	5.800	1.700	0.110	NQ	0.085

CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Dichloroiodomethane: LLE ECD (IDL= 0.5 ug/l; MDL= 0.5 ug/l)						
No. of Samples	92		1	67	72	66
No. Detected	3		0	3	27	6
No. Above MDL	1		0	3	26	3
Arithmetic Mean	0.27		ND	0.27	0.49	0.29
Standard Deviation	0.11			0.09	0.36	0.13
Geometric Mean					0.39	
Spread Factor					2.06	
Median Value	ND		ND	ND	ND	ND
90% Less Than	ND		ND	ND	1.0	ND
Dichloroiodomethane: LLE ECD [grab samples] (IDL= 0.5 ug/l; MDL= 0.5 ug/l)						
No. of Samples	8					
No. Detected	0					
No. Above MDL	0					
Arithmetic Mean	ND					
Standard Deviation						
Median Value	ND					
90% Less Than	ND					
Dichloroiodomethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Total Trihalomethanes: LLE ECD (IDL= 0.1 ug/l; MDL= 0.2 ug/l)						
No. of Samples	94	42	99	226	228	209
No. Detected	94	42	98	226	228	209
No. Above MDL	92	39	97	226	228	209
Arithmetic Mean	13.14	9.16	1.87	68.46	66.35	55.88
Standard Deviation	14.77	5.68	1.65	24.75	25.97	31.45
Geometric Mean	7.72	5.77	1.25	63.59	61.37	48.19
Spread Factor	3.37	3.95	2.58	1.50	1.49	1.79
Median Value	9.5	10.1	1.1	67.3	63.2	50.8
90% Less Than	25.1	14.0	4.3	95.3	102.9	92.6
Total Trihalomethanes: LLE ECD [grab samples] (IDL= 0.1 ug/l; MDL= 0.2 ug/l)						
No. of Samples	59					
No. Detected	59					
No. Above MDL	57					
Arithmetic Mean	6.06					
Standard Deviation	4.03					
Geometric Mean	4.31					
Spread Factor	2.72					
Median Value	5.7					
90% Less Than	11.7					

TABLE H-10
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	EEWTP Finished Water Phase IA	Phase IB	Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Bromochloromethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.6 ug/l)						
No. of Samples	18	8	13	39	38	37
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Bromomethane: purge & trap GCMS (IDL= 0.1 ug/l; MDL= 0.3 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride: LLE ECD (IDL= 0.1 ug/l; MDL= 0.2 ug/l)						
No. of Samples	99	41	99	227	230	208
No. Detected	49	3	0	129	163	100
No. Above MDL	6	0	0	30	42	14
Arithmetic Mean	0.11	NQ	ND	0.13	0.17	0.12
Standard Deviation	0.07			0.12	0.20	0.11
Geometric Mean					0.07	
Spread Factor					3.09	
Median Value	ND	ND	ND	NQ	NQ	ND
90% Less Than	NQ	ND	ND	0.2	0.3	NQ
Carbon Tetrachloride: LLE ECD [grab samples] (IDL= 0.1 ug/l; MDL= 0.2 ug/l)						
No. of Samples	62					
No. Detected	48					
No. Above MDL	9					
Arithmetic Mean	0.27					
Standard Deviation	1.00					
Median Value	NQ					
90% Less Than	0.2					
Carbon Tetrachloride: purge & trap GCMS (IDL= 0.3 ug/l; MDL= 0.5 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	2	0	0	5	7	7
No. Above MDL	0	0	0	0	1	1
Arithmetic Mean	NQ	ND	ND	NQ	0.21	0.20
Standard Deviation					0.17	0.12
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	NQ	NQ	NQ
Maximum Value	NQ	ND	ND	NQ	1.1	0.7

TABLE H-10
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Chloromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	1	0	0	1	1	1
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	ND	NQ	NQ	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	NQ	NQ	NQ
Dichlorodifluoromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Dichloromethane (Methylene chloride): purge & trap GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	1	0	2	2	5	4
No. Above MDL	0	0	0	0	1	0
Arithmetic Mean	NQ	ND	NQ	NQ	0.23	NQ
Standard Deviation					0.57	
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	NQ	ND	NQ	ND
Maximum Value	NQ	ND	NQ	NQ	3.2	NQ
Iodoform: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	8	1	1	10	11	11
No. Above MDL	6	1	1	4	5	6
Arithmetic Mean	0.37	0.11	0.29	0.28	0.33	0.55
Standard Deviation	0.49	0.16	0.87	0.77	0.77	2.07
Geometric Mean	0.26					0.03
Spread Factor	2.89					13.93
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	1.3	0.5	ND	0.4	0.4	0.8
Maximum Value	1.6	0.5	3.2	4.1	3.6	13.0

TABLE H-10
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Chloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane: CLS GCMS (IDL= 0.002 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.6 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	2	0	0	1
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	NQ	ND	ND	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	NQ	ND	ND	ND
Maximum Value	ND	ND	NQ	ND	ND	NQ
1,2-Dichloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-10
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Hexachloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	1	1	1
No. Above MDL	0	0	0	0	1	0
Arithmetic Mean	ND	ND	ND	NQ	0.09	NQ
Standard Deviation					0.28	
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	NQ	1.8	NQ
Hexachloroethane: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Hexachloroethane: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 7.5 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	1	2	0	2	1	3
No. Above MDL	0	0	0	0	1	2
Arithmetic Mean	NQ	NQ	ND	NQ	0.0032	0.0099
Standard Deviation					0.0134	0.0354
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	ND	ND	NQ
Maximum Value	NQ	NQ	ND	NQ	0.066	0.180

TABLE H-10
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
1,1,1-Trichloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	10	0	2	14	6	7
No. Above MDL	0	0	0	7	0	0
Arithmetic Mean	NQ	ND	NQ	0.12	NQ	NQ
Standard Deviation				0.12		
Geometric Mean				0.09		
Spread Factor				2.23		
Median Value	NQ	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	NQ	0.3	NQ	NQ
Maximum Value	NQ	ND	NQ	0.6	NQ	NQ
1,1,2-Trichloroethane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane: CLS GCMS						
(IDL= 0.001 ug/l;MDL= 0.070 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	1	0	0	1	1	2
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	ND	NQ	NQ	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	NQ	NQ	NQ
1,2-Dibromo-3-chloropropane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-10
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
1,2-Dichloropropane: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.080 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	3	0	0	1	2	2
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	ND	NQ	NQ	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	NQ	NQ	NQ

TABLE H-11
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES

(Note: Analysis for compounds by Acid w/ methylation
and by CLS GCMS began on 1 December, 1981)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Chloroetnene (Vinyl chloride): purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	1	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	NQ	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	NQ	ND	ND
cis-1,2-Dichloroethene: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	1
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	NQ
trans-1,2-Dichloroethene: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	1	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	ND	ND	ND
Tetrachloroethene: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	99	41	99	227	230	209
No. Detected	50	14	4	83	94	72
No. Above MDL	1	1	0	4	4	2
Arithmetic Mean	0.15	0.13	NQ	0.13	0.15	0.14
Standard Deviation	0.10	0.14		0.12	0.17	0.27
Median Value	NQ	ND	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	NQ	NQ	NQ

TABLE H-11
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Tetrachloroethene: LLE ECD [grab samples]						
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	62					
No. Detected	33					
No. Above MDL	0					
Arithmetic Mean	NQ					
Median Value	NQ					
90% Less Than	NQ					
Tetrachloroethene: purge & trap GCMS						
(IDL= 0.2 ug/l;MDL= 0.5 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	6	0	0	7	8	6
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	ND	NQ	NQ	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	NQ	NQ	NQ
Maximum Value	NQ	ND	ND	NQ	NQ	NQ
Tetrachloroethene: CLS GCMS						
(IDL= 0.010 ug/l;MDL= 0.020 ug/l)						
No. of Samples	9	5	10	32	24	28
No. Detected	3	3	9	21	16	16
No. Above MDL	3	3	8	21	16	16
Arithmetic Mean	0.0589	0.0612	0.0956	0.0804	0.0490	0.0378
Standard Deviation	0.0897	0.0741	0.1157	0.0980	0.0433	0.0374
Geometric Mean	0.0084	0.0241	0.0532	0.0435	0.0347	0.0267
Spread Factor	11.78	5.14	3.13	3.57	2.66	2.69
Median Value	ND	ND	0.053	0.070	0.047	0.030
90% Less Than	0.230	0.160	0.170	0.120	0.100	0.077
Maximum Value	0.230	0.160	0.390	0.490	0.160	0.150
Trichloroethene: LLE ECD						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	99	41	99	227	230	209
No. Detected	12	2	1	41	42	25
No. Above MDL	1	0	0	1	3	2
Arithmetic Mean	0.08	NQ	NQ	0.08	0.08	0.07
Standard Deviation	0.13			0.10	0.07	0.05
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	NQ	NQ	NQ
Trichloroethene: LLE ECD [grab samples]						
(IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	62					
No. Detected	22					
No. Above MDL	10					
Arithmetic Mean	0.16					
Standard Deviation	0.21					
Geometric Mean	0.11					
Spread Factor	2.68					
Median Value	ND					
90% Less Than	0.4					

TABLE H-11
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Trichloroethene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.7 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	3	0	1	1	4	3
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	NQ	NQ	NQ	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND	ND	ND
Maximum Value	NQ	ND	NQ	NQ	NQ	NQ
Trichloroethene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.130 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	3	8	3	6
No. Above MDL	0	0	3	6	2	5
Arithmetic Mean	ND	ND	0.0543	0.0255	0.0107	0.0146
Standard Deviation			0.0906	0.0522	0.0292	0.0326
Geometric Mean			0.1012			
Spread Factor			1.60			
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	0.170	0.045	ND	0.030
Maximum Value	ND	ND	0.240	0.200	0.120	0.130
cis-1,2-Dichloropropene: Purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-11
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKENES
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Hexachlorobutadiene: purge & trap GCMS (IDL= 1.0 ug/l; MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene: CLS GCMS (IDL= 0.001 ug/l; MDL= 0.050 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL=12.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981; Analysis for compounds by Acid without methylation was terminated on 31 November, 1981)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Benzene: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	2	0	0	3	2	5
No. Above MDL	2	0	0	2	2	4
Arithmetic Mean	0.09	ND	ND	0.08	0.06	0.09
Standard Deviation	0.15			0.17	0.07	0.19
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	0.1	ND	ND	ND	ND	NQ
Maximum Value	0.7	ND	ND	1.1	0.5	1.1
Ethenylbenzene: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Ethenylbenzene: CLS GCMS						
(IDL= 0.005 ug/l;MDL= 0.020 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	6	4	4	26	18	24
No. Above MDL	3	2	2	15	6	11
Arithmetic Mean	0.0212	0.0128	0.0341	0.0283	0.0213	0.0279
Standard Deviation	0.0220	0.0094	0.0866	0.0336	0.0239	0.0321
Geometric Mean	0.0137	0.0185	0.0023	0.0183	0.0081	0.0149
Spread Factor	2.88	1.23	12.48	2.62	4.16	3.11
Median Value	NQ	NQ	ND	NQ	NQ	NQ
90% Less Than	0.063	0.025	0.021	0.046	0.060	0.055
Maximum Value	0.063	0.025	0.280	0.160	0.085	0.130
Ethylbenzene: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	5	0	0	4	4	4
No. Above MDL	0	0	0	1	1	2
Arithmetic Mean	NQ	ND	ND	0.06	0.05	0.05
Standard Deviation				0.02	0.02	0.02
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	NQ	ND	ND
Maximum Value	NQ	ND	ND	0.1	0.1	0.1
Ethylbenzene: CLS GCMS						
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	7	6	3	21	11	17
No. Above MDL	3	0	1	7	2	4
Arithmetic Mean	0.0356	NQ	0.0130	0.0325	0.0157	0.0211
Standard Deviation	0.0389		0.0210	0.0453	0.0204	0.0221
Geometric Mean	0.0276			0.0150		
Spread Factor	2.27			3.58		
Median Value	NQ	NQ	ND	NQ	ND	NQ
90% Less Than	0.130	NQ	NQ	0.063	NQ	0.053
Maximum Value	0.130	NQ	0.068	0.190	0.090	0.087

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Propylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Propylbenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.010 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	4	0	2	14	8	8
No. Above MDL	2	0	1	3	0	0
Arithmetic Mean	0.0085	ND	0.0019	0.0072	NQ	NQ
Standard Deviation	0.0167		0.0032	0.0244		
Geometric Mean	0.0030					
Spread Factor	4.72					
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	0.052	ND	NQ	NQ	NQ	NQ
Maximum Value	0.052	ND	0.010	0.140	NQ	NQ
Toluene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	3	0	0	11	12	8
No. Above MDL	3	0	0	11	12	8
Arithmetic Mean	0.13	ND	ND	0.20	0.14	0.15
Standard Deviation	0.20			0.33	0.17	0.31
Geometric Mean	0.01			0.03	0.05	0.02
Spread Factor	13.08			8.71	4.37	9.48
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	0.6	ND	ND	0.7	0.3	0.4
Maximum Value	0.7	ND	ND	1.6	0.8	1.8
Toluene: CLS GCMS (IDL= 0.020 ug/l;MDL= 0.090 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	4	3	1	17	11	14
No. Above MDL	4	2	1	13	9	7
Arithmetic Mean	0.0813	0.0520	0.0310	0.0941	0.0742	0.0588
Standard Deviation	0.0960	0.0518	0.0664	0.1075	0.0885	0.0675
Geometric Mean	0.0828	0.0791		0.0757	0.0708	0.0531
Spread Factor	2.05	1.37		2.48	2.19	2.25
Median Value	ND	ND	ND	NQ	ND	ND
90% Less Than	0.270	0.130	ND	0.220	0.200	0.137
Maximum Value	0.270	0.130	0.220	0.420	0.300	0.240
1,2-Xylene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.1 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	6	0	0	4	5	5
No. Above MDL	5	0	0	1	2	2
Arithmetic Mean	0.07	ND	ND	0.06	0.06	0.06
Standard Deviation	0.02			0.02	0.02	0.02
Geometric Mean	Not					
Spread Factor	Calculated					
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	0.1	ND	ND	NQ	NQ	NQ
Maximum Value	0.1	ND	ND	0.1	0.1	0.1

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
1,2-Xylene: CLS GCMS						
(IDL= 0.005 ug/l;MDL= 0.030 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	5	6	3	22	12	17
No. Above MDL	4	2	1	10	0	7
Arithmetic Mean	0.0355	0.0222	0.0108	0.0224	NQ	0.0173
Standard Deviation	0.0413	0.0073	0.0170	0.0228		0.0153
Geometric Mean	0.0283	0.0289		0.0210		0.0229
Spread Factor	2.52	1.08		1.97		1.52
Median Value	NQ	NQ	ND	NQ	ND	NQ
90% Less Than	0.120	0.033	NQ	0.036	NQ	0.039
Maximum Value	0.120	0.033	0.056	0.085	NQ	0.050
1,3-Xylene/1,4-Xylene: purge & trap GCMS						
(IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	6	0	0	6	7	7
No. Above MDL	0	0	0	0	0	1
Arithmetic Mean	NQ	ND	ND	NQ	NQ	0.09
Standard Deviation						0.09
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	NQ	NQ	NQ
Maximum Value	NQ	ND	ND	NQ	NQ	0.4
1,3-Xylene/1,4-Xylene: CLS GCMS						
(IDL= 0.005 ug/l;MDL= 0.040 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	5	6	3	21	9	17
No. Above MDL	4	2	1	6	0	7
Arithmetic Mean	0.0505	0.0298	0.0142	0.0246	NQ	0.0438
Standard Deviation	0.0638	0.0116	0.0246	0.0280		0.0922
Geometric Mean	0.0370	0.0375		0.0182		0.0142
Spread Factor	2.74	1.17		2.41		4.52
Median Value	NQ	NQ	ND	NQ	ND	NQ
90% Less Than	0.190	0.041	NQ	0.044	NQ	0.066
Maximum Value	0.190	0.041	0.080	0.120	NQ	0.460
Nitrobenzene: Base neut. LLE GCMS						
(IDL= 0.5 ug/l;MDL= 2.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1-Methyl-2,4-dinitrobenzene: Base neut. LLE GCMS						
(IDL= 1.0 ug/l;MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water Phase IA	Phase IB	Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
1-Methyl-2,6-Dinitrobenzene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Benzylbutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL= 7.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)						
No. of Samples	13	3	5	21	20	21
No. Detected	0	0	0	1	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	NQ	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	NQ	ND	ND
Di-n-Butylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 9.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	1	1	2
No. Above MDL	0	0	0	0	0	1
Arithmetic Mean	ND	ND	ND	NQ	NQ	1.18
Standard Deviation						3.82
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	NQ	NQ	19.0
Dicyclohexylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Diethylphthalate: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 9.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	1	0	0	0	0	2
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND	ND	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	ND	ND	NQ
Diisobutylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Dimethylphthalate: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL=10.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Dioctylphthalate: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Diphenylphthalate: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected		0	0	0	0	0
No. Above MDL		0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Phenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	1	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	NQ	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	NQ	ND
Phenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	1	4	2
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	NQ	NQ	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	NQ	ND
Maximum Value	ND	ND	ND	NQ	NQ	NQ
2,4-Dimethylphenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
2,4-Dimethylphenol: Acid LLE (w/ methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
2,4-Dinitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 5.0 ug/l:MDL=NA ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2-Methyl-4,6-dinitrophenol: Acid LLE (w/o methyl.) GCMS (IDL=10.0 ug/l:MDL=NA ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
2-Methyl-4,6-dinitrophenol: Acid LLE (w/ methyl.) GCMS (IDL=10.0 ug/l:MDL=NA ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2-Nitrophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l:MDL=NA ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
2-Nitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l:MDL=10.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
4-Nitrophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
4-Nitrophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Acenaphthene: CLS GCMS (IDL= 0.010 ug/l;MDL=NA ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Acenaphthene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 3.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Acenaphthylene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)						
No. of Samples	13	3	5	21	20	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water Phase IA	Phase IB	Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Naphthalene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	1	0
No. Above MDL	0	0	0	0	1	0
Arithmetic Mean	ND	ND	ND	ND	0.06	ND
Standard Deviation					0.07	
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	0.5	ND
Naphthalene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.040 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	2	1	1	6	4	4
No. Above MDL	2	0	0	1	2	1
Arithmetic Mean	0.0311	NQ	NQ	0.0122	0.0126	0.0100
Standard Deviation	0.0548			0.0236	0.0227	0.0158
Geometric Mean	0.0129					
Spread Factor	4.81					
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	0.158	NQ	ND	NQ	NQ	NQ
Maximum Value	0.158	NQ	NQ	0.135	0.110	0.084
Naphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 2.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Anthracene: CLS GCMS (IDL= 0.050 ug/l;MDL= 0.090 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Anthracene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 6.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Benzidine: Base neut. LLE GCMS (IDL=50.0 ug/l;MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=10.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=20.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

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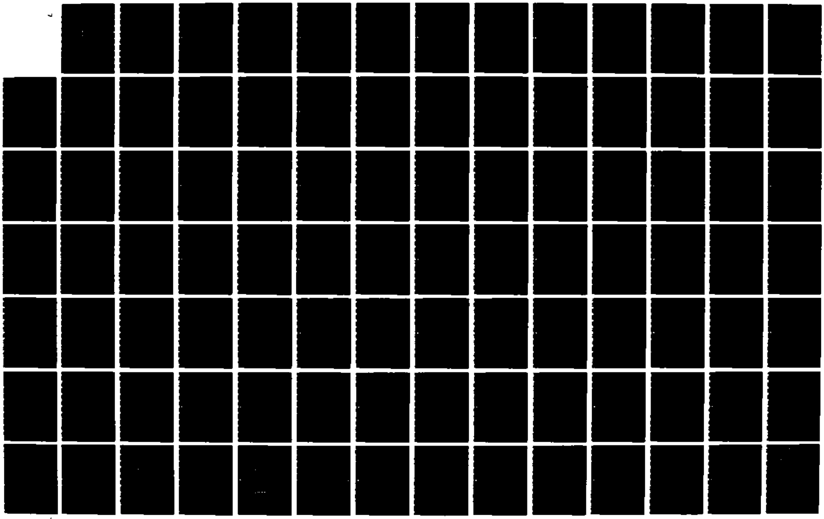
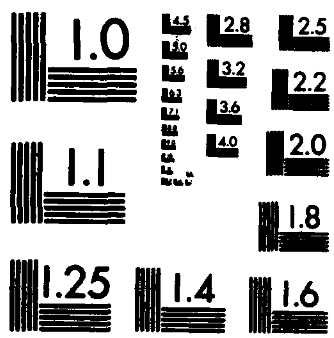




MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Benzo(a)pyrene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL=10.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Chrysene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL= 6.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene: Base neut. LLE GCMS (IDL= 1.0 ug/l; MDL= 9.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine: Base neut. LLE GCMS (IDL= 5.0 ug/l; MDL= 8.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,2-Diphenylhydrazine/Azobenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 7.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water			WTP 1	WTP 2	WTP 3
	Phase IA	Phase IB	Phase IIA	Finished Water	Finished Water	Finished Water
1,2-Diphenylhydrazine/Azobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.100 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Fluoranthene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)						
No. of Samples	13	3	5	21	20	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Fluorene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 3.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Fluorene: CLS GCMS (IDL= 0.010 ug/l;MDL= 0.080 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL=30.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-12
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Phenanthrene: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 5.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Phenanthrene: CLS GCMS (IDL= 0.050 ug/l; MDL= 0.120 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Pyrene: Base neut. LLE GCMS (IDL= 0.5 ug/l; MDL= 5.0 ug/l)						
No. of Samples	13	3	5	21	20	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981; Analysis for compounds by Acid without methylation was terminated on 31 November, 1981)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Bromobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Bromobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Bromobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	2	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	ND	ND	ND
Chlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	1	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	ND	ND	ND
Chlorobenzene: CLS GCMS (IDL= 0.005 ug/l;MDL= 0.020 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
4-Chloro-1-methylbenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
4-Chloro-1-methylbenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	1	0	1	0	1
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	NQ	ND	NQ	ND	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	NQ	ND	ND	ND	ND
Maximum Value	ND	NQ	ND	NQ	ND	NQ

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water Phase IA	Phase IB	Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
1,3-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 4.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene: CLS GCMS (IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	4	1	2	9	2	6
No. Above MDL	0	0	0	2	0	0
Arithmetic Mean	NQ	NQ	NQ	0.0040	NQ	NQ
Standard Deviation				0.0077		
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	NQ	NQ	ND	NQ
Maximum Value	NQ	NQ	NQ	0.030	NQ	NQ
1,4-Dichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 6.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
1,4-Dichlorobenzene: CLS GCMS						
(IDL= 0.0001 ug/l;MDL= 0.0200 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	4	1	1	10	6	7
No. Above MDL	0	0	0	1	0	0
Arithmetic Mean	NQ	NQ	NQ	0.0037	NQ	NQ
Standard Deviation				0.0062		
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	NQ	ND	NQ	NQ	NQ
Maximum Value	NQ	NQ	NQ	0.027	NQ	NQ
Hexachlorobenzene: Base neut. LLE GCMS						
(IDL= 0.5 ug/l;MDL= 2.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Hexachlorobenzene: CLS GCMS						
(IDL= 0.005 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1-Chloro-2-nitrobenzene: Base neut. LLE GCMS						
(IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1-Chloro-3-nitrobenzene: Base neut. LLE GCMS						
(IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
1-Chloro-4-nitrobenzene: Base neut. LLE GCMS (IDL= 5.0 ug/l:MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l:MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l:MDL= 0.030 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	2	0	0	4	2	2
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	ND	NQ	NQ	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	ND	ND	ND
Maximum Value	NQ	ND	ND	NQ	NQ	NQ
1,2,4-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l:MDL= 0.5 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene: Base neut. LLE GCMS (IDL= 0.1 ug/l:MDL= 8.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
1,2,4-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	4	0	0	5	3	3
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	ND	NQ	NQ	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	ND	NQ	ND	ND
Maximum Value	NQ	ND	ND	NQ	NQ	NQ
1,3,5-Trichlorobenzene: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,3,5-Trichlorobenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.020 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2-Chlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
2-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
2-Chloro-3-methylphenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
2-Chloro-3-methylphenol: Acid LLE Methyl GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
3-Chlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 4.0 ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
3-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
4-Chlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=NA ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
4-Chlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 9.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	N
4-Chloro-3-methylphenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)						
No. of Samples	11			11	11	
No. Detected	0			0	0	
No. Above MDL	0			0	0	
Arithmetic Mean	ND			ND	ND	
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
4-Chloro-3-methylphenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 6.0 ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
2,4-Dichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water Phase IA	Phase IB	Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Pentachlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 5.0 ug/l;MDL=30.0 ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
Pentachlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 4.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2,3,5-Trichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 8.0 ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
2,3,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2,3,6-Trichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 7.0 ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
2,3,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 6.0 ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
2,4,5-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 8.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol: Acid LLE (w/o methyl.) GCMS (IDL= 0.5 ug/l;MDL= 7.0 ug/l)						
No. of Samples	11			11	11	11
No. Detected	0			0	0	0
No. Above MDL	0			0	0	0
Arithmetic Mean	ND			ND	ND	ND
Median Value	ND			ND	ND	ND
90% Less Than	ND			ND	ND	ND
Maximum Value	ND			ND	ND	ND
2,4,6-Trichlorophenol: Acid LLE (w/ methyl.) GCMS (IDL= 1.0 ug/l;MDL= 7.0 ug/l)						
No. of Samples	3	4	6	12	14	12
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
1-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l:MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1-Chloronaphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l:MDL= 2.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1-Chloronaphthalene: CLS GCMS (IDL= 0.001 ug/l:MDL= 0.050 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene: purge & trap GCMS (IDL= 0.5 ug/l:MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene: Base neut. LLE GCMS (IDL= 0.1 ug/l:MDL= 9.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
2-Chloronaphthalene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.050 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Arochlor 1016: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Arochlor 1221: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Arochlor 1232: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Arochlor 1242: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-13
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED AROMATICS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Arochlor 1248: LLE ECD (IDL= 0.2 ug/l;MDL= 0.4 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Arochlor 1254: LLE ECD (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Arochlor 1260: LLE ECD (IDL= 0.1 ug/l;MDL= 0.4 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-14
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Aldrin: LLE ECD (IDL= 0.01 ug/l;MDL= 0.10 ug/l)						
No. of Samples	15	4	2	22	23	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Atrazine: Base neut. LLE GCMS (IDL= 5.0 ug/l;MDL= 9.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Alpha-BHC: LLE ECD (IDL= 0.01 ug/l;MDL= 0.20 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Beta-BHC: LLE ECD (IDL= 0.01 ug/l;MDL= 0.20 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Delta-BHC: LLE ECD (IDL= 0.01 ug/l;MDL= 0.03 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-14
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
Gamma-BHC: LLE ECD						
(IDL= 0.01 ug/l;MDL= 0.02 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Chlordane: LLE ECD						
(IDL= 0.01 ug/l;MDL=NA ug/l)						
No. of Samples	15	4	2	22	23	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
4,4′-DDD: LLE ECD						
(IDL= 0.01 ug/l;MDL= 0.10 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
4,4′-DDE: LLE ECD						
(IDL= 0.01 ug/l;MDL= 1.00 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
4,4′-DDT: LLE ECD						
(IDL= 0.01 ug/l;MDL= 0.09 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	1	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	NQ	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	NQ	ND	ND

TABLE H-14
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	EEWTP Finished Water			WTP 1	WTP 2	WTP 3
	Phase IA	Phase IB	Phase IIA	Finished Water	Finished Water	Finished Water
Dieldrin: LLE ECD						
(IDL= 0.01 ug/l:MDL= 0.10 ug/l)						
No. of Samples	15	4	2	22	23	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Endrin: LLE ECD						
(IDL= 0.01 ug/l:MDL= 0.07 ug/l)						
No. of Samples	15	4	2	22	23	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Endosulfan I: LLE ECD						
(IDL= 0.01 ug/l:MDL= 0.03 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Endosulfan II: LLE ECD						
(IDL= 0.01 ug/l:MDL= 0.03 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Endosulfan sulfate: LLE ECD						
(IDL= 0.01 ug/l:MDL= 0.02 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	1	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	NQ	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	NQ	ND	ND

TABLE H-14
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Heptachlor: LLE ECD						
(IDL= 0.01 ug/l:MDL= 0.20 ug/l)						
No. of Samples	15	4	2	22	23	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Heptachlor epoxide: LLE ECD						
(IDL= 0.01 ug/l:MDL= 0.10 ug/l)						
No. of Samples	15	4	2	22	23	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene: Base neut. LLE GCMS						
(IDL= 1.0 ug/l:MDL=20.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene: CLS GCMS						
(IDL= 0.010 ug/l:MDL= 0.340 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Kepone: LLE ECD						
(IDL= 0.01 ug/l:MDL= 2.00 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-14
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Methoxychlor: LLE ECD (IDL= 0.01 ug/l:MDL= 0.09 ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	1	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Toxaphene: LLE ECD (IDL= 0.01 ug/l:MDL=NA ug/l)						
No. of Samples	15	4	7	26	28	26
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2,3,7,8-Tetrachlorodibenzo-p-dioxin: Base neut. LLE GCMS (IDL=10.0 ug/l:MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Tricresolphosphate: Base neut. LLE GCMS (IDL=50.0 ug/l:MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2,4-D: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l:MDL= 0.1 ug/l)						
No. of Samples	15	3	7	23	23	24
No. Detected	0	0	0	0	2	1
No. Above MDL	0	0	0	0	2	1
Arithmetic Mean	ND	ND	ND	ND	0.09	0.12
Standard Deviation					0.13	0.34
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	0.6	1.7

TABLE H-14
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
SYNTHETIC ORGANIC CHEMICALS -- PESTICIDES / HERBICIDES
(Continued)

	EEWTP Finished Water			WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
	Phase IA	Phase IB	Phase IIA			
2,4,5-T: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.3 ug/l)						
No. of Samples	15	3	7	23	23	24
No. Detected	0	0	0	0	1	1
No. Above MDL	0	0	0	0	1	1
Arithmetic Mean	ND	ND	ND	ND	0.08	0.10
Standard Deviation					0.14	0.23
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	0.7	1.2
2,4,5-TP: LLE (w/ methyl.) ECD (IDL= 0.1 ug/l;MDL= 0.5 ug/l)						
No. of Samples	15	3	7	23	23	24
No. Detected	0	0	0	0	2	1
No. Above MDL	0	0	0	0	1	1
Arithmetic Mean	ND	ND	ND	ND	0.08	0.09
Standard Deviation					0.11	0.18
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	0.5	0.9

TABLE H-15
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS

(Note: Analysis for compounds by Acid w/ methylation and by CLS GCMS began on 1 December, 1981)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
N-Nitrosodimethylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL=10.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine: Base neut. LLE GCMS (IDL= 0.1 ug/l;MDL= 5.0 ug/l)						
No. of Samples	13	3	5	21	20	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
N-Nitrosodipropylamine: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)						
No. of Samples	13	3	5	21	20	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1-Bromo-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 5.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1-Bromo-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-15
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	EEWTP Finished Water Phase IA	Phase IB	Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
1-Chloro-4-phenoxybenzene: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 8.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1-Chloro-4-phenoxybenzene: CLS GCMS (IDL= 0.001 ug/l;MDL= 0.030 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether: purge & trap GCMS (IDL= 0.1 ug/l;MDL=NA ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether: Base neut. LLE GCMS (IDL= 1.0 ug/l;MDL=NA ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,1'-(Methylenebis(oxy))-bis-2-chloroethane: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)						
No. of Samples	13	3	5	21	20	21
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND

TABLE H-15
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
1,1'-Oxybis(2-chloroethane): Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 4.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
1,1'-Oxybis(2-chloroethane): CLS GCMS (IDL= 0.005 ug/l;MDL= 0.080 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
2,2'-Oxybis(2-chloropropane): Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Tetrahydrofuran: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 0.2 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	3	0	1	22	5	3
No. Above MDL	3	0	1	22	5	3
Arithmetic Mean	0.20	ND	0.09	8.86	0.18	0.34
Standard Deviation	0.44		0.15	13.02	0.46	1.56
Geometric Mean	0.02			0.73		
Spread Factor	9.73			32.17		
Median Value	ND	ND	ND	5.8	ND	ND
90% Less Than	0.3	ND	ND	22.0	0.2	ND
Maximum Value	1.8	ND	0.6	71.0	2.4	9.9
Acetone: purge & trap GCMS (IDL= 0.5 ug/l;MDL= 0.5 ug/l)						
No. of Samples	18	8	12	37	39	40
No. Detected	2	2	3	10	7	7
No. Above MDL	2	2	3	10	7	7
Arithmetic Mean	1.42	0.60	1.30	1.67	1.47	0.93
Standard Deviation	3.44	0.89	2.18	3.39	3.45	1.95
Geometric Mean		0.17	0.08	0.097	0.02	0.03
Spread Factor		4.72	17.90	17.73	44.33	19.75
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	9.6	2.8	3.4	6.0	4.0	1.9
Maximum Value	12.0	2.8	7.3	16.0	18.0	8.7

TABLE H-15
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 1 FEBRUARY 1983
MISCELLANEOUS QUANTIFIED ORGANIC CHEMICALS
(Continued)

	EEWTP Finished Water Phase IA	Phase IB	Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
2-Butanone: purge & trap GCMS (IDL= 0.1 ug/l;MDL= 1.0 ug/l)						
No. of Samples	18	8	13	39	40	40
No. Detected	0	0	1	7	2	3
No. Above MDL	0	0	1	5	0	1
Arithmetic Mean	ND	ND	0.18	0.52	NQ	0.25
Standard Deviation			0.49	1.30		1.12
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	2.3	ND	ND
Maximum Value	ND	ND	1.8	6.0	NQ	7.1
Isophorone: Base neut. LLE GCMS (IDL= 0.5 ug/l;MDL= 3.0 ug/l)						
No. of Samples	15	4	7	25	26	25
No. Detected	0	0	0	0	0	0
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	ND	ND	ND
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	ND	ND	ND
Geosmin: CLS GCMS (IDL= 0.0005 ug/l;MDL= 0.0500 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	2	0	2	10	6	12
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	NQ	ND	NQ	NQ	NQ	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	NQ	ND	NQ	NQ	NQ	NQ
Maximum Value	NQ	ND	NQ	NQ	NQ	NQ
Methylisoborneol: CLS GCMS (IDL= 0.0005 ug/l;MDL= 0.0400 ug/l)						
No. of Samples	9	6	10	32	24	28
No. Detected	0	0	0	1	1	2
No. Above MDL	0	0	0	0	0	0
Arithmetic Mean	ND	ND	ND	NQ	NQ	NQ
Median Value	ND	ND	ND	ND	ND	ND
90% Less Than	ND	ND	ND	ND	ND	ND
Maximum Value	ND	ND	ND	NQ	NQ	NQ

TABLE H - 16
CHARACTERIZATION OF EFFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
VOLATILE ORGANIC ANALYSIS (PURGE AND TRAP, GC/MS)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES						
Halogenated Methanes (Other Than THMs)						
Carbonic dichloride						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	0 / 41	1 / 41	1 / 41
Range of Concentrations	ND	ND	ND	ND	NQ	NQ
Cyanogen chloride						
No of Times Detected/No of Samples	5 / 18	0 / 8	0 / 13	5 / 41	7 / 41	4 / 41
Range of Concentrations	NQ	ND	ND	NQ - NQ	NQ - 3.3	NQ
Trichloronitromethane						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	2 / 41	3 / 41
Range of Concentrations	ND	ND	ND	NQ	NQ	NQ
Halogenated Ethanes						
1,2-Dichloro-1,1,2,2-tetrafluoroethane						
No of Times Detected/No of Samples	0 / 18	1 / 8	0 / 13	1 / 41	1 / 41	2 / 41
Range of Concentrations	ND	4.1	ND	1.6	1.1	0.3 - 1.
Halogenated Alkanes (C3 or greater)						
1-Chlorobutane						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	0 / 41	1 / 41	1 / 41
Range of Concentrations	ND	ND	ND	ND	NQ	NQ
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)						
Alkylbenzenes						
Benzaldehyde						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	0 / 41	0 / 41
Range of Concentrations	ND	ND	ND	NQ	ND	ND
1-Ethyl-2-methylbenzene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	2 / 41	1 / 41	1 / 41
Range of Concentrations	ND	ND	ND	NQ - 1.5	NQ	NQ
1-Ethyl-4-methylbenzene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	0 / 41	1 / 41
Range of Concentrations	ND	ND	ND	0.5	ND	0.2
1-Methylethylbenzene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	1 / 41	1 / 41
Range of Concentrations	ND	ND	ND	0.3	0.4	0.1
1,2,3-Trimethylbenzene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	0 / 41	0 / 41
Range of Concentrations	ND	ND	ND	2.4	ND	ND
1,2,4-Trimethylbenzene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	0 / 41	0 / 41
Range of Concentrations	ND	ND	ND	0.4	ND	ND
Naphthalenes						
Decahydronaphthalene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	0 / 41	1 / 41	1 / [illegible]
Range of Concentrations	ND	ND	ND	ND	0.1	0.[illegible]
MISCELLANEOUS ORGANIC CHEMICALS						
Alcohols						
2-Methylpropanol						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	0 / 41	0 / 41	1 / 41
Range of Concentrations	ND	ND	ND	ND	ND	0.2
Aldehydes						
Butanal						
No of Times Detected/No of Samples	2 / 18	0 / 8	0 / 13	2 / 41	[illegible] / 41	[illegible]
Range of Concentrations	NQ	ND	ND	NQ	NQ	NQ
Decanal						
No of Times Detected/No of Samples	1 / 18	0 / 8	0 / 13	0 / 41	1 / 41	1 / 41
Range of Concentrations	NQ	ND	ND	ND	NQ	NQ
Heptanal						
No of Times Detected/No of Samples	1 / 18	0 / 8	0 / 13	0 / 41	0 / 41	[illegible]
Range of Concentrations	NQ	ND	ND	ND	ND	NQ
Hexanal						
No of Times Detected/No of Samples	1 / 18	0 / 8	0 / 13	2 / 41	1 / [illegible]	1 / [illegible]
Range of Concentrations	NQ	ND	ND	NQ	NQ	NQ
2-Methylbutanal						
No of Times Detected/No of Samples	3 / 18	0 / 8	0 / 13	7 / 41	[illegible]	[illegible]
Range of Concentrations	NQ	ND	ND	NQ	NQ	NQ - [illegible]
2-Methylpentanal						
No of Times Detected/No of Samples	1 / 18	0 / 8	0 / 13	0 / 41	0 / [illegible]	[illegible]
Range of Concentrations	NQ	ND	ND	NQ	ND	NQ
2-Methylpropanal						
No of Times Detected/No of Samples	2 / 18	0 / 8	0 / 13	[illegible] / 41	[illegible]	11 / [illegible]
Range of Concentrations	NQ	ND	ND	NQ	NQ - 1.[illegible]	NQ - [illegible]
Nonanal						
No of Times Detected/No of Samples	3 / 18	0 / 8	0 / 13	[illegible] / 41	[illegible]	2 / [illegible]
Range of Concentrations	NQ	ND	ND	NQ	NQ	NQ
Pentanal						
No of Times Detected/No of Samples	5 / 18	0 / 8	0 / 13	[illegible] / 41	7 / [illegible]	[illegible]
Range of Concentrations	NQ	ND	ND	NQ	NQ	NQ - [illegible]

TABLE H - 16
CHARACTERIZATION OF EFFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
VOLATILE ORGANIC ANALYSIS (PURGE AND TRAP, GC/MS)
(Concentrations reported in ug/L)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES						
Halogenated Methanes (Other Than THMs)						
Carbonic dichloride						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	0 / 41	1 / 41	1 / 41
Range of Concentrations	ND	ND	ND	ND	NQ	NQ
Cyanogen chloride						
No of Times Detected/No of Samples	5 / 18	0 / 8	0 / 13	5 / 41	7 / 41	4 / 41
Range of Concentrations	NQ	ND	ND	NQ - NQ	NQ - 3.3	NQ
Trichloronitromethane						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	2 / 41	3 / 41
Range of Concentrations	ND	ND	ND	NQ	NQ	NQ
Halogenated Ethanes						
1,2-Dichloro-1,1,2,2-tetrafluoroethane						
No of Times Detected/No of Samples	0 / 18	1 / 8	0 / 13	1 / 41	1 / 41	2 / 41
Range of Concentrations	ND	4.1	ND	1.6	1.1	0.3 - 1.6
Halogenated Alkanes (C3 or greater)						
1-Chlorobutane						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	0 / 41	1 / 41	1 / 41
Range of Concentrations	ND	ND	ND	ND	NQ	NQ
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)						
Alkylbenzenes						
Benzaldehyde						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	C / 41	0 / 41
Range of Concentrations	ND	ND	ND	NQ	ND	ND
1-Ethyl-2-methylbenzene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	2 / 41	1 / 41	1 / 41
Range of Concentrations	ND	ND	ND	NQ - 1.5	NQ	NQ
1-Ethyl-4-methylbenzene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	0 / 41	1 / 41
Range of Concentrations	ND	ND	ND	0.5	ND	0.2
1-Methylethylbenzene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	1 / 41	1 / 41
Range of Concentrations	ND	ND	ND	0.3	0.4	0.4
1,2,3-Trimethylbenzene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	0 / 41	0 / 41
Range of Concentrations	ND	ND	ND	2.4	ND	ND
1,2,4-Trimethylbenzene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	1 / 41	0 / 41	0 / 41
Range of Concentrations	ND	ND	ND	0.4	ND	ND
Naphthalenes						
Decahydronaphthalene						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	0 / 41	1 / 41	1 / 41
Range of Concentrations	ND	ND	ND	ND	0.1	0.1
MISCELLANEOUS ORGANIC CHEMICALS						
Alcohols						
2-Methylpropanol						
No of Times Detected/No of Samples	0 / 18	0 / 8	0 / 13	0 / 41	0 / 41	1 / 41
Range of Concentrations	ND	ND	ND	ND	ND	0.2
Aldehydes						
Butanal						
No of Times Detected/No of Samples	2 / 18	0 / 8	0 / 13	2 / 41	3 / 41	3 / 41
Range of Concentrations	NQ	ND	ND	NQ	NQ	NQ
Decanal						
No of Times Detected/No of Samples	1 / 18	0 / 8	0 / 13	0 / 41	1 / 41	1 / 41
Range of Concentrations	NQ	ND	ND	ND	NQ	NQ
Heptanal						
No of Times Detected/No of Samples	1 / 18	0 / 8	0 / 13	0 / 41	0 / 41	0 / 41
Range of Concentrations	NQ	ND	ND	ND	ND	ND
Hexanal						
No of Times Detected/No of Samples	1 / 18	0 / 8	0 / 13	2 / 41	1 / 41	4 / 41
Range of Concentrations	NQ	ND	ND	NQ	NQ	NQ
2-Methylbutanal						
No of Times Detected/No of Samples	3 / 18	0 / 8	0 / 13	7 / 41	9 / 41	9 / 41
Range of Concentrations	NQ	ND	ND	NQ	NQ	NQ - 0.3
2-Methylpentanal						
No of Times Detected/No of Samples	1 / 18	0 / 8	0 / 13	0 / 41	0 / 41	0 / 41
Range of Concentrations	NQ	ND	ND	ND	ND	ND
2-Methylpropanal						
No of Times Detected/No of Samples	2 / 18	0 / 8	0 / 13	9 / 41	9 / 41	11 / 41
Range of Concentrations	NQ	ND	ND	NQ	NQ - 1.9	NQ - 0.2
Nonanal						
No of Times Detected/No of Samples	3 / 18	0 / 8	0 / 13	2 / 41	3 / 41	2 / 41
Range of Concentrations	NQ	ND	ND	ND	NQ	NQ
Pentanal						
No of Times Detected/No of Samples	5 / 18	0 / 8	0 / 13	8 / 41	7 / 41	8 / 41
Range of Concentrations	NQ	ND	ND	NQ	NQ	NQ - 0.3

TABLE H - 17
CHARACTERIZATION OF EFFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
ACID EXTRACTION (W / METHYLATION) AND GC/MS
(Concentrations reported in ug/L)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)						
Alkylbenzenes						
Benzoic acid						
No of Times Detected/No of Samples	1 / 5	0 / 3	0 / 7	1 / 15	0 / 16	0 / 15
Range of Concentrations	10	ND	ND	12	ND	ND
MISCELLANEOUS ORGANIC CHEMICALS						
Organic Acids						
Decanoic acid						
No of Times Detected/No of Samples	0 / 5	0 / 3	1 / 7	0 / 15	0 / 16	0 / 15
Range of Concentrations	ND	ND	1.8	ND	ND	ND
Dodecanoic acid						
No of Times Detected/No of Samples	2 / 5	0 / 3	1 / 7	4 / 15	1 / 16	3 / 15
Range of Concentrations	2 - 6	ND	5	0.4 - 6	1	2 - 10
Hexadecanoic acid						
No of Times Detected/No of Samples	3 / 5	0 / 3	0 / 7	3 / 15	2 / 16	4 / 15
Range of Concentrations	3 - 5	ND	ND	1 - 4	1 - 2	0.7 - 6
Octadecanoic acid						
No of Times Detected/No of Samples	2 / 5	0 / 3	0 / 7	1 / 15	1 / 16	3 / 15
Range of Concentrations	4	ND	ND	2	0.9	1
Octanoic acid						
No of Times Detected/No of Samples	0 / 5	0 / 3	1 / 7	0 / 15	0 / 16	0 / 15
Range of Concentrations	ND	ND	1.9	ND	ND	ND
Tetradecanoic acid						
No of Times Detected/No of Samples	2 / 5	1 / 3	0 / 7	2 / 15	1 / 16	2 / 15
Range of Concentrations	2	0.2	ND	1	1.8	3 - 7

TABLE H - 18
CHARACTERIZATION OF EFFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
BASE/NEUTRAL EXTRACTION AND GC/MS
(Concentrations reported in ug/L)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)						
Alkylbenzenes						
alpha,alpha-dimethylbenzenemethanol						
No of Times Detected/No of Samples	0 / 15	0 / 4	0 / 7	0 / 26	0 / 26	1 / 25
Range of Concentrations	ND	ND	ND	ND	ND	10
Phenols						
2,6-Bis(1,1-Dimethylethyl)-4-methylphenol						
No of Times Detected/No of Samples	0 / 15	1 / 4	0 / 7	1 / 26	1 / 26	2 / 25
Range of Concentrations	ND	1.9	ND	1.7	1.8	0.8 - 15
MISCELLANEOUS ORGANIC [illegible]ICALS						
Alcohols						
2-Ethylhexanol						
No of Times Detected/No of Samples	0 / 15	0 / 4	0 / 7	0 / 2[illegible]	0 / 26	1 / 25
Range of Concentrations	ND	ND	ND	ND	ND	16
Nitriles						
Benzeneacetonitrile						
No of Times Detected/No of Samples	0 / 15	0 / 4	0 / 7	1 / 26	0 / 26	0 / 25
Range of Concentrations	ND	ND	ND	ND	ND	ND

TABLE H - 19
CHARACTERIZATION OF EFFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finishe Water
SYNTHETIC ORGANIC CHEMICALS -- HALOGENATED ALKANES						
Halogenated Ethanes						
1,1,1-Trichloroethane						
No of Times Detected/No of Samples	5 / 9	0 / 6	0 / 10	5 / 32	3 / 24	3 / 2
Range of Concentrations	.053 - 2.2	ND	ND	.38 - .85	.90 - 2.9	NQ - .
Halogenated Alkanes (C3 or greater)						
1,2,3-Trichloropropane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	2 / 2
Range of Concentrations	ND	ND	ND	ND	.012	.0038 -.0
SYNTHETIC ORGANIC CHEMICALS -- AROMATIC HYDROCARBONS (Non-Halogenated)						
Alkylbenzenes						
Benzaldehyde						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	0 / 2
Range of Concentrations	ND	ND	ND	ND	.012	ND
1,1-Dimethyldecylbenzene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.47
(1,1-Dimethylethyl)benzene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	4 / 32	1 / 24	1 / 2
Range of Concentrations	ND	ND	ND	.0037 - .015	.003	.034
1-Ethyl-2,4-dimethylbenzene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	2 / 2
Range of Concentrations	ND	ND	ND	.0075	ND	.0058 -.0
1-Ethyl-3,5-dimethylbenzene						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 2
Range of Concentrations	.0044	ND	ND	ND	ND	.0074
2-Ethyl-1,4-dimethylbenzene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	1 / 2
Range of Concentrations	ND	ND	ND	.018	ND	.015
4-Ethyl-1,2-dimethylbenzene						
No of Times Detected/No of Samples	2 / 9	0 / 6	0 / 10	1 / 32	1 / 24	1 / 2
Range of Concentrations	.0064 -.010	ND	ND	.0047	.0065	.0072
1-Ethyl-2-methylbenzene						
No of Times Detected/No of Samples	7 / 9	3 / 6	1 / 10	17 / 32	8 / 24	14 / 2
Range of Concentrations	.0043 -.032	.015 - .022	.009	.0083 - .067	.0055 - .026	.010 -.0
1-Ethyl-3-methylbenzene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2
Range of Concentrations	ND	ND	ND	.034	ND	ND
1-Ethyl-4-methylbenzene						
No of Times Detected/No of Samples	3 / 9	1 / 6	1 / 10	10 / 32	4 / 24	6 / 2
Range of Concentrations	.076 -.011	.017	.007	.0047 - .099	.0036 -.020	.0073 -.0
(1-Methylethenyl)benzene						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 2
Range of Concentrations	.0052	ND	ND	ND	ND	ND
(1-Methylethyl)benzene						
No of Times Detected/No of Samples	2 / 9	0 / 6	0 / 10	2 / 32	1 / 24	0 / 2
Range of Concentrations	.0026 -.007	ND	ND	.0026 - .009	.003	ND
1-Methyl-2-(1-methylethyl)benzene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	2 / 32	0 / 24	0 / 2
Range of Concentrations	ND	ND	ND	.0049 - .0069	ND	ND
1-Methyl-3-(1-methylethyl)benzene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2
Range of Concentrations	ND	ND	ND	.0083	ND	ND
1-Methyl-4-(1-methylethyl)benzene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2
Range of Concentrations	ND	ND	ND	.0068	ND	ND
1-Methyl-2-propylbenzene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.0032
1,2,3,5-Tetramethylbenzene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	3 / 32	1 / 24	4 / 2
Range of Concentrations	ND	ND	ND	.0042 - .010	.0029	.0028-.00
1,2,4,5-Tetramethylbenzene						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	4 / 32	1 / 24	5 / 2
Range of Concentrations	.0077	ND	ND	.0038 - .011	.0046	.0033-.01
1,2,3-Trimethylbenzene						
No of Times Detected/No of Samples	6 / 9	3 / 6	0 / 10	16 / 32	9 / 24	14 / 2
Range of Concentrations	.0046 -.068	.0057 -.018	ND	.008 - .088	.011 - .032	.0075-.0
1,2,4-Trimethylbenzene						
No of Times Detected/No of Samples	4 / 9	0 / 6	1 / 10	14 / 32	8 / 24	12 / 2
Range of Concentrations	.0046 -.017	ND	.008	.0058 - .030	.0065 - .028	.0025-.0
1,2,5-Trimethylbenzene						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	1 / 32	1 / 24	0 / 2
Range of Concentrations	.016	ND	ND	.011	.0078	ND
1,3,5-Trimethylbenzene						
No of Times Detected/No of Samples	3 / 9	0 / 6	0 / 10	10 / 32	5 / 24	4 / 2
Range of Concentrations	.0062 -.013	ND	ND	.0047 - .019	.0048 - .020	.012-.0

TABLE H - 19
CHARACTERIZATION OF EFFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Phthalates						
Dibutylphthalate						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	2 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	.055	ND	ND	.130 - .174	ND	ND
Phenols						
2,6-Bis(1,1-dimethylethyl)-4-methylphenol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	1 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	.033	.043	.050
Naphthalenes						
Decahydronaphthalene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	4 / 2[illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.032 - .25
Decahydro-2-methylnaphthalene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	4 / 2[illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.010 - .14
1,2,3,4-Tetrahydro-5,6-dimethylnaphthalene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.0053
1,2,3,4-Tetrahydro-1-methylnaphthalene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	.0038	ND	.0017
1,2,3,4-Tetrahydro-2-methylnaphthalene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.0017
1,2,3,4-Tetrahydro-5-methylnaphthalene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	.0013	ND	.010
1,2,3,4-Tetrahydro-6-methylnaphthalene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	.0096	ND	.026
1,2,3,4-Tetrahydronaphthalene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	2 / 2[illegible]
Range of Concentrations	ND	ND	ND	ND	.0029	.0072-.01[illegible]
Other multiring aromatics						
2,3-Dihydro-1,1,3-trimethyl-3-phenylindene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	1 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	.029	.030	.033
1,3-Dimethylindan						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.0021
Indan						
No of Times Detected/No of Samples	2 / 9	0 / 6	0 / 10	7 / 32	4 / 24	4 / 2[illegible]
Range of Concentrations	.017 - .029	ND	ND	.007 - .025	.008 - .023	.0041-.0[illegible]
Indene						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	.008	ND	ND	ND	ND	ND
1-Methylindan						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.0095	ND	ND
4-Methylindan						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	3 / 32	1 / 24	4 / 2[illegible]
Range of Concentrations	ND	ND	ND	.0059 - .019	.0041	.0079 -.0[illegible]
5-Methylindan						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	3 / 32	0 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	.0044 - .0071	ND	.0044
MISCELLANEOUS ORGANIC CHEMICALS						
Heterocyclic Compounds						
Dihydro-4,4-dimethylfuranone						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.011	ND	ND
2-Methyl-3-(1-methylethyl)aziridine						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	.021	ND	.012
Ketones						
1,5-bis(1,1-dimethylpropyl)-2,5-cyclohexadiene-1,4-dione						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	ND	.0094	ND
1,1-Dichloro-2-propanone						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	2 / 32	1 / 24	3 / 2[illegible]
Range of Concentrations	.041	ND	ND	.10 - .13	.033	.025 - .[illegible]
4-Hydroxy-4-methyl-2-pentanone						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	1 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.044	.020	ND
4-Hydroxy-4-methyl-2-propanone						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.081	ND	ND

TABLE H - 19
CHARACTERIZATION OF EFFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
4-Methyl-2-pentanone						
No of Times Detected/No of Samples	2 / 9	0 / 6	0 / 10	2 / 32	0 / 24	1 / 28
Range of Concentrations	.032 - .450	ND	ND	.016 - .033	ND	.016
4,5-Octanedione						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 28
Range of Concentrations	.053	ND	ND	ND	ND	ND
3-Pentanone						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 28
Range of Concentrations	ND	ND	ND	ND	ND	.084
1,1,1-Trichloro-2-propanone						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 28
Range of Concentrations	ND	ND	ND	ND	ND	.12
Natural Odor Producing Compounds						
1-Methyl-4-(1-methylethyl)-7-oxabicyclo-(2.2.1)heptane						
No of Times Detected/No of Samples	3 / 9	0 / 6	0 / 10	3 / 32	0 / 24	4 / 28
Range of Concentrations	.015 - .025	ND	ND	.005 - .026	ND	.0039 -.03
1,3,3-Trimethylbicyclo-(2.2.1)heptan-2-ol						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 28
Range of Concentrations	.0057	ND	ND	ND	ND	ND
1,3,3-Trimethylbicyclo-(2.2.1)heptan-2-one						
No of Times Detected/No of Samples	2 / 9	0 / 6	0 / 10	2 / 32	0 / 24	2 / 28
Range of Concentrations	.0077 - .014	ND	ND	.0064 - .015	ND	.0074 -.01
1,3,3-Trimethyl-2-oxabicyclo(2.2.2)octane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	2 / 32	0 / 24	2 / 28
Range of Concentrations	ND	ND	ND	.0043 - .015	ND	.011 -.01
Organic Acids						
Hexadecanoic Acid						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	1 / 24	1 / 28
Range of Concentrations	ND	ND	ND	.12	.027	.39
Alcohols						
Dimethylhexanol						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 28
Range of Concentrations	.010	ND	ND	ND	ND	ND
2,2-Dimethyl-1-octanol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	0 / 28
Range of Concentrations	ND	ND	ND	ND	.0076	ND
2-Ethylhexanol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	2 / 32	1 / 24	3 / 28
Range of Concentrations	ND	ND	ND	.008 - .030	.005	.010 -.03
2-Ethyl-4-methylpentanol						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 28
Range of Concentrations	.012	ND	ND	ND	ND	ND
Hexanol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	1 / 28
Range of Concentrations	ND	ND	ND	ND	.110	.048
Isooctanol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	1 / 28
Range of Concentrations	ND	ND	ND	.0087	ND	.0052
6-Methyl-1-heptanol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 28
Range of Concentrations	ND	ND	ND	ND	ND	.0073
4-Methyl-1-hexanol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	2 / 28
Range of Concentrations	ND	ND	ND	ND	ND	.020 -.02
8-Methyl-1,8-nonanediol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	0 / 28
Range of Concentrations	ND	ND	ND	ND	.0082	ND
6-Methyl-1-octanol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 28
Range of Concentrations	ND	ND	ND	ND	ND	.0036
4-Methyl-2-propylpentanol						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 28
Range of Concentrations	.0092	ND	ND	ND	ND	ND
9-Octadecen-1-ol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	0 / 28
Range of Concentrations	ND	ND	ND	ND	.011	ND
Aldehy es						
Decanal						
No of Times Detected/No of Samples	3 / 9	1 / 6	2 / 10	8 / 32	9 / 24	7 / 28
Range of Concentrations	.015 - .069	.0078	.031 - .092	.009 - .19	.011 - .73	.017 -.05
2-Ethylhexanal						
No of Times Detected/No of Samples	1 / 9	1 / 6	0 / 10	0 / 32	1 / 24	0 / 28
Range of Concentrations	.0088	.019	ND	ND	.010	ND
Nonanal						
No of Times Detected/No of Samples	2 / 9	0 / 6	2 / 10	10 / 32	12 / 24	8 / 28
Range of Concentrations	.011 - .074	ND	.041 - .090	.0053-.180	.012 - .500	.0055-.052
Heptanal						
No of Times Detected/No of Samples	0 / 9	0 / 6	4 / 10	6 / 32	4 / 24	3 / 28
Range of Concentrations	ND	ND	.0034 - .098	.006 - .015	.0021 - .011	.010 -.02

TABLE H - 1[illegible]
CHARACTERIZATION OF EFFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Hexanal						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	6 / 32	7 / 24	2 / [illegible]
Range of Concentrations	.044	ND	ND	.024 - .040	.0064 - .043	.016 - .1[illegible]
3-Methylbutanal						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / [illegible]
Range of Concentrations	ND	ND	ND	.042	ND	ND
Alkanes						
2,4-Dimethylhexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / [illegible]
Range of Concentrations	ND	ND	ND	.030	ND	ND
2,6-Dimethyl[illegible]tane						
No of Times Detected/No of Samples	0 / 9	0 / 6	1 / 10	0 / 32	0 / 24	0 / [illegible]
Range of Concentrations	ND	ND	.031	ND	ND	ND
3,4-Dimethylpentane						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / [illegible]
Range of Concentrations	.039	ND	ND	ND	ND	ND
Docosane						
No of Times Detected/No of Samples	0 / 9	0 / 6	1 / 10	0 / 32	0 / 24	0 / [illegible]
Range of Concentrations	ND	ND	.015	ND	ND	ND
Dodecane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	1 / [illegible]
Range of Concentrations	ND	ND	ND	.016	ND	.022
3-Ethyl-2-methylpentane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / [illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.055
2-Nitropropane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	5 / 32	3 / 24	3 / [illegible]
Range of Concentrations	ND	ND	ND	.040 - .140	.034 - .066	.058 -.1[illegible]
Octadecane						
No of Times Detected/No of Samples	0 / 9	0 / 6	1 / 10	0 / 32	0 / 24	0 / [illegible]
Range of Concentrations	ND	ND	.012	ND	ND	ND
2,2,3,4-Tetramethylpentane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / [illegible]
Range of Concentrations	ND	ND	ND	.0052	ND	ND
2,6,10,14-Tetramethylpentadecane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	1 / [illegible]
Range of Concentrations	ND	ND	ND	ND	.0050	.0085
1,2,3-Trimethylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / [illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.047
2,2,5-Trimethylhexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / [illegible]
Range of Concentrations	ND	ND	ND	.087	ND	ND
Alkenes						
2-Methyl-1-pentadecene						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	1 / 24	1 / [illegible]
Range of Concentrations	.059	ND	ND	ND	.031	.033
1-Pentene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / [illegible]
Range of Concentrations	ND	ND	ND	.011	ND	ND
3,4,5-Trimethyl-1-hexene						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	1 / 24	0 / [illegible]
Range of Concentrations	ND	ND	ND	.041	.0012	ND
1-Undecyne						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / [illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.040
Cyclic Alkanes						
Cyclohexanemethanol						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / [illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.023
Cyclopropylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	0 / [illegible]
Range of Concentrations	ND	ND	ND	ND	.005	ND
1-Cyclopropyl-2-propanone						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	[illegible]
Range of Concentrations	ND	ND	ND	ND	.024	ND
Diethylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / [illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.04[illegible]
1-Ethyl-3-methylcyclopentane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	1 / 24	1 / [illegible]
Range of Concentrations	ND	ND	ND	.03[illegible]	.[illegible]40	[illegible]
1-Ethyl-2-methylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	[illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.017 - [illegible]
1-Ethyl-4-methylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / [illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.032

TABLE H - 19
CHARACTERIZATION OF EFFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
3-Methylcycloheptanone						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2
Range of Concentrations	ND	ND	ND	.006	ND	ND
Methylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	1 / 10	1 / 32	1 / 24	1 / 2
Range of Concentrations	ND	ND	.007	.110	.021	.027
Methylenecyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	2 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.0060 -.0
1-(1-Methylethyl)-2-nonylcyclopropane						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 2
Range of Concentrations	.097	ND	ND	ND	ND	ND
1-Methyl-1-ethylcyclopentane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	2 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.017 -.0
1-Methylethylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	3 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.057 - .
1-Methyl-4-(1-methylethenyl)cyclohexane						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 2
Range of Concentrations	.0077	ND	ND	ND	ND	ND
1-Methyl-4-(1-methylethyl)cyclohexane						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 2
Range of Concentrations	.0062	ND	ND	ND	ND	ND
2-Methylpropylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.036
1-Propenylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.014
1,1,3-Trimethylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	1 / 2
Range of Concentrations	ND	ND	ND	ND	.016	.010
1,2,4-Trimethylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	2 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.019 -.0
1,3,5-Trimethylcyclohexane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	2 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.029 -.0
Cyclic Alkenes						
1-(1-Cyclohexenyl)-1-propanone						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 2
Range of Concentrations	.019	ND	ND	ND	ND	ND
1-(1-Cyclohexenyl-1-yl)-1-propanone						
No of Times Detected/No of Samples	1 / 9	0 / 6	0 / 10	0 / 32	0 / 24	0 / 2
Range of Concentrations	.0074	ND	ND	ND	ND	ND
2-Ethyl-1,1'-bicyclohexyl						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	2 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.019 -.0
2-Methyl-1,1'-bicyclohexyl						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 2
Range of Concentrations	ND	ND	ND	ND	ND	.025
1-Methyl-4-(1-methylethenyl)cyclohexene						
No of Times Detected/No of Samples	2 / 9	0 / 6	0 / 10	1 / 32	1 / 24	3 / 2
Range of Concentrations	.0029 - .071	ND	ND	.011	.0049	.018 -.0
3,5,5-Trimethyl-2-cyclohexen-1-one						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	0 / 2
Range of Concentrations	ND	ND	ND	ND	.017	ND
Esters						
Acetic Acid butyl ester						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	1 / 2
Range of Concentrations	ND	ND	ND	.019	ND	.019
Butyl acetate						
No of Times Detected/No of Samples	1 / 9	1 / 6	0 / 10	0 / 32	1 / 24	0 / 2
Range of Concentrations	.013	.023	ND	ND	.061	ND
Butyl-2,2-dichloropropanoate						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	1 / 24	1 / 2
Range of Concentrations	ND	ND	ND	.180	.010	.110
Butyl-2-methylpropanaote						
No of Times Detected/No of Samples	0 / 9	0 / 6	1 / 10	0 / 32	1 / 24	2 / 2
Range of Concentrations	ND	ND	.042	ND	.230	.022 -.04
Butyl-2-propanoate						
No of Times Detected/No of Samples	0 / 9	0 / 6	1 / 10	0 / 32	0 / 24	0 / 2
Range of Concentrations	ND	ND	.017	ND	ND	ND

TABLE H - 19
CHARACTERIZATION OF EFFLUENTS
ORGANIC CHEMICALS TENTATIVELY IDENTIFIED BY
CLOSED LOOP STRIPPING AND GC/MS
(Continued)

	EEWTP Finished Water Phase IA	EEWTP Finished Water Phase IB	EEWTP Finished Water Phase IIA	WTP 1 Finished Water	WTP 2 Finished Water	WTP 3 Finished Water
Decanoic Acid, methyl ester						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.076	ND	ND
Heneicosanoic acid methyl ester						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.022	ND	ND
2-Methyl propanoic acid, butyl ester						
No of Times Detected/No of Samples	0 / 9	0 / 6	2 / 10	2 / 32	2 / 24	4 / 2[illegible]
Range of Concentrations	ND	ND	.040 - .058	.032 - .28	.030 - .040	.0082-.0[illegible]
1-Methylpropylbutanoate						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	ND	.28	.040
Octyl-2-propenoate						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	1 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	ND	.016	ND
Tridecanoic acid methyl ester						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.052	ND	ND
Ethers						
1,1-Dodecanediol diacetate						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.042	ND	ND
(Ethenyloxy)isoctane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	0 / 32	0 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	ND	ND	.011
Nitriles						
Dichloroacetonitrile						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.054	ND	ND
Isocyanoethane						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	2 / 32	0 / 24	1 / 2[illegible]
Range of Concentrations	ND	ND	ND	.035 - .058	ND	.170
Sulfur containing organic compounds						
Dimethyldisulfide						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.080	ND	ND
Dimethyltrisulfide						
No of Times Detected/No of Samples	0 / 9	0 / 6	0 / 10	1 / 32	0 / 24	0 / 2[illegible]
Range of Concentrations	ND	ND	ND	.023	ND	ND

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 %[1] Confidence Interval	Mutagenic Ratio
		EEWTP Finished Water (Phase IA)			
3-Jun-1981	TA98	79.10	6.53	3.17	1.5
	TA98+S9	79.10	2.74	9.13	1.4
	TA100	79.10	36.40	10.74	1.7
	TA100+S9	79.10	33.36	24.31	1.3
9-Jun-1981	TA98	68.10	-.48	2.84	1.3
	TA98+S9	68.10	2.46	6.40	1.1
	TA100	68.10	13.58	19.84	1.1
	TA100+S9	68.10	5.86	16.18	1.1
18-Jun-1981	TA98	75.70	.48	5.93	.9
	TA98+S9	75.70	-1.25	8.99	.8
	TA100	75.70	21.06	17.92	1.4
	TA100+S9	75.70	-12.42	23.67	1.3
30-Jun-1981	TA98	100.00	-2.23	5.18	.6
	TA98+S9	100.00	-4.18	3.86	.9
	TA100	100.00	19.78	13.00	1.5
	TA100+S9	100.00	6.63	24.08	1.5
9-Jul-1981	TA98	105.00	2.42	2.82	1.4
	TA98+S9	105.00	N.A.	N.A.	N.A.
	TA100	105.00	19.50	9.04	1.3
	TA100+S9	105.00	N.A.	N.A.	N.A.
15-Jul-1981	TA98	100.00	5.15	4.19	1.5
	TA98+S9	100.00	.92	1.41	1.5
	TA100	100.00	24.48	18.67	1.3
	TA100+S9	100.00	2.15	7.93	1.3
22-Jul-1981	TA98	105.00	2.95	4.91	1.8
	TA98+S9	105.00	2.59	3.12	1.4
	TA100	105.00	25.44	16.30	1.5
	TA100+S9	105.00	12.58	15.98	1.3
6-Aug-1981	TA98	88.90	1.93	3.44	1.4
	TA98+S9	88.90	.93	2.44	1.7
	TA100	88.90	28.33	8.36	2.9
	TA100+S9	88.90	8.39	10.74	1.3
14-Aug-1981	TA98	94.00	-.54	2.35	1.8
	TA98+S9	94.00	-1.50	3.14	1.6
	TA100	94.00	-1.26	3.40	1.0
	TA100+S9	94.00	.96	4.42	1.1
21-Aug-1981	TA98	101.00	1.56	1.68	1.6
	TA98+S9	101.00	1.46	1.76	1.5
	TA100	101.00	26.05	8.21	2.8
	TA100+S9	101.00	17.18	6.02	2.3
28-Aug-1981	TA98	105.00	5.24	1.21	2.9
	TA98+S9	105.00	1.91	1.49	1.8
	TA100	105.00	36.80	8.74	3.6
	TA100+S9	105.00	19.38	5.78	2.4
4-Sep-1981	TA98	100.00	3.03	1.28	1.9
	TA98+S9	100.00	2.28	1.10	1.9
	TA100	100.00	28.97	9.86	2.4
	TA100+S9	100.00	9.98	2.78	1.5
18-Sep-1981	TA98	90.00	.51	1.49	1.1
	TA98+S9	90.00	.79	1.75	1.5
	TA100	90.00	.82	4.75	1.1
	TA100+S9	90.00	2.35	5.83	1.1
25-Sep-1981	TA98	94.00	.52	1.11	1.2
	TA98+S9	94.00	1.46	1.48	1.3
	TA100	94.00	2.73	6.17	1.3
	TA100+S9	94.00	5.27	6.17	1.5
2-Oct-1981	TA98	119.00	.37	1.52	1.3
	TA98+S9	119.00	.37	1.38	1.0
	TA100	119.00	N.A.	N.A.	N.A.
	TA100+S9	119.00	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % Confidence Interval[1]	Mutagenic Ratio
EEWTP Finished Water (Phase IA, continued)					
6-Oct-1981					
	TA98	114.00	3.18	1.38	2.0
	TA98+S9	114.00	2.39	2.10	1.7
	TA100	114.00	15.46	4.76	2.1
	TA100+S9	114.00	3.63	5.01	1.4
13-Oct-1981					
	TA98	91.00	-.44	2.24	1.2
	TA98+S9	91.00	-.22	2.24	1.
	TA100	91.00	N.A.	N.A.	N.A.
	TA100+S9	91.00	N.A.	N.A.	N.A.
22-Oct-1981					
	TA98	85.00	2.23	1.62	1.9
	TA98+S9	85.00	.78	1.56	1.4
	TA100	85.00	3.89	5.93	1.2
	TA100+S9	85.00	5.99	5.73	1.3
29-Oct-1981					
	TA98	110.00	-.05	.97	1.4
	TA98+S9	110.00	.65	1.47	1.3
	TA100	110.00	1.85	4.36	1.2
	TA100+S9	110.00	-2.47	5.05	1.1
5-Nov-1981					
	TA98	107.90	-6.99	10.72	.7
	TA98+S9	107.90	-20.97	24.54	.6
	TA100	107.90	3.61	5.15	1.4
	TA100+S9	107.90	1.59	5.60	1.3
10-Nov-1981					
	TA98	83.30	2.41	2.72	1.4
	TA98+S9	83.30	.59	1.64	1.1
	TA100	83.30	10.85	3.56	1.5
	TA100+S9	83.30	11.82	4.96	1.6
19-Nov-1981					
	TA98	97.00	.85	1.53	1.8
	TA98+S9	97.00	.66	1.89	1.1
	TA100	97.00	-3.38	4.86	1.0
	TA100+S9	97.00	1.93	7.34	1.3
24-Nov-1981					
	TA98	98.00	.94	1.85	1.7
	TA98+S9	98.00	-.07	1.85	1.2
	TA100	98.00	-4.55	3.57	.9
	TA100+S9	98.00	3.44	4.89	1.2
10-Dec-1981					
	TA98	94.60	N.A.	N.A.	N.A.
	TA98+S9	94.60	N.A.	N.A.	N.A.
	TA100	94.60	N.A.	N.A.	N.A.
	TA100+S9	94.60	N.A.	N.A.	N.A.
15-Dec-1981					
	TA98	64.30	N.A.	N.A.	N.A.
	TA98+S9	64.30	N.A.	N.A.	N.A.
	TA100	64.30	N.A.	N.A.	N.A.
	TA100+S9	64.30	N.A.	N.A.	N.A.
22-Dec-1981					
	TA98	83.30	N.A.	N.A.	N.A.
	TA98+S9	83.30	N.A.	N.A.	N.A.
	TA100	83.30	N.A.	N.A.	N.A.
	TA100+S9	83.30	N.A.	N.A.	N.A.
29-Dec-1981					
	TA98	96.50	.92	1.0	1.3
	TA98+S9	96.50	1.0	1.60	1.7
	TA100	96.50	10.81	5.28	1.5
	TA100+S9	96.50	6.28	4.45	1.3
5-Jan-1982					
	TA98	92.70	.59	.83	1.2
	TA98+S9	92.70	.53	1.85	1.3
	TA100	92.70	2.96	6.79	1.4
	TA100+S9	92.70	2.02	4.73	1.1
27-Jan-1982					
	TA98	18.90	.21	4.64	1.0
	TA98+S9	18.90	.63	4.64	1.1
	TA100	18.90	-.42	27.86	1.
	TA100+S9	18.90	.0	120.72	1.0
9-Feb-1982					
	TA98	94.60	3.51	38.61	1.1
	TA98+S9	94.60	-1.58	2.72	1.2
	TA100	94.60	24.32	6.95	2.0
	TA100+S9	94.60	7.71	5.06	1.3
9-Feb-1982 (2nd Set)					
	TA98	94.60	.21	1.09	1.3
	TA98+S9	94.60	.29	1.74	1.3
	TA100	94.60	4.65	4.11	1.2
	TA100+S9	94.60	2.17	3.94	1.1

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 %[1] Confidence Interval	Mutagenic Ratio
		EEWTP Finished Water (Phase IA, continued)			
16-Feb-1982					
	TA98	106.00	N.A.	N.A.	N.A.
	TA98+S9	106.00	N.A.	N.A.	N.A.
	TA100	106.00	N.A.	N.A.	N.A.
	TA100+S9	106.00	N.A.	N.A.	N.A.
23-Feb-1982					
	TA98	106.00	N.A.	N.A.	N.A.
	TA98+S9	106.00	N.A.	N.A.	N.A.
	TA100	106.00	N.A.	N.A.	N.A.
	TA100+S9	106.00	N.A.	N.A.	N.A.
24-Feb-1982					
	TA98	117.30	1.14	1.31	1.4
	TA98+S9	117.30	1.09	1.19	1.3
	TA100	117.30	5.48	4.81	1.3
	TA100+S9	117.30	3.77	5.39	1.3
2-Mar-1982					
	TA98	102.20	N.A.	N.A.	N.A.
	TA98+S9	102.20	N.A.	N.A.	N.A.
	TA100	102.20	1.38	3.39	1.1
	TA100+S9	102.20	.89	4.08	1.1
3-Mar-1982					
	TA98	121.10	1.98	.90	1.9
	TA98+S9	121.10	N.A.	N.A.	N.A.
	TA100	121.10	6.87	2.60	1.5
	TA100+S9	121.10	N.A.	N.A.	N.A.
9-Mar-1982					
	TA98	87.10	N.A.	N.A.	N.A.
	TA98+S9	87.10	N.A.	N.A.	N.A.
	TA100	87.10	3.95	3.26	1.2
	TA100+S9	87.10	3.19	4.95	1.2

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 %[1] Confidence Interval	Mutagenic Ratio
			EEWTP Finished Water (Phase IB)		
17-Mar-1982					
	TA98	83.30	.43	1.60	1.1
	TA98	81.40	-.33	2.58	1.2
	TA98+S9	83.30	1.78	1.28	1.5
	TA98+S9	81.40	.68	1.12	1.2
	TA100	83.30	9.25	3.71	1.3
	TA100	81.40	2.46	4.56	1.2
	TA100+S9	83.30	7.89	3.26	1.3
	TA100+S9	81.40	2.02	3.32	1.1
24-Mar-1982					
	TA98	3.80	.56	7.41	1.0
	TA98+S9	3.80	3.52	6.37	1.3
	TA100	3.80	28.52	24.30	1.3
	TA100+S9	3.80	26.67	15.63	1.3
30-Mar-1982					
	TA98	75.70	.88	1.54	1.4
	TA98+S9	75.70	2.93	2.93	2.3
	TA100	75.70	6.10	4.27	1.3
	TA100+S9	75.70	5.17	7.04	1.3
31-Mar-1982					
	TA98	83.30	1.84	1.74	1.7
	TA98+S9	83.30	1.36	1.68	1.3
	TA100	83.30	-3.26	4.56	.9
	TA100+S9	83.30	2.79	4.51	1.1
6-Apr-1982					
	TA98	98.40	.13	1.33	1.1
	TA98+S9	98.40	.64	1.29	1.2
	TA100	98.40	.75	4.20	1.1
	TA100+S9	98.40	3.53	3.89	1.2
7-Apr-1982					
	TA98	87.10	.62	1.63	1.5
	TA98+S9	87.10	.41	1.43	1.2
	TA100	87.10	-1.54	4.18	1.
	TA100+S9	87.10	1.26	4.46	1.2
20-Apr-1982					
	TA98	87.10	-.48	1.02	.8
	TA98+S9	87.10	-.02	1.55	1.0
	TA100	87.10	4.07	3.19	1.2
	TA100+S9	87.10	.74	5.11	1.1
21-Apr-1982					
	TA98	79.50	.13	1.72	.9
	TA98+S9	79.50	-.70	1.14	1.0
	TA100	79.50	3.45	4.79	1.2
	TA100+S9	79.50	-.44	5.08	1.
27-Apr-1982					
	TA98	79.50	1.64	1.82	1.5
	TA98+S9	79.50	.33	1.51	1.2
	TA100	79.50	2.44	7.32	1.1
	TA100+S9	79.50	6.73	4.48	1.3
28-Apr-1982					
	TA98	109.80	-.03	1.07	1.2
	TA98+S9	109.80	-.12	1.30	1.1
	TA100	109.80	3.73	4.74	1.2
	TA100+S9	109.80	2.93	4.16	1.2
4-May-1982					
	TA98	87.10	.21	1.56	1.
	TA98+S9	87.10	3.43	10.85	5.2
	TA100	87.10	-.98	3.77	1.1
	TA100+S9	87.10	3.71	4.95	1.2
5-May-1982					
	TA98	87.10	.89	1.04	1.3
	TA98+S9	87.10	-.67	1.34	1.0
	TA100	87.10	N.A.	N.A.	N.A.
	TA100+S9	87.10	N.A.	N.A.	N.A.
11-May-1982					
	TA98	87.10	.66	2.29	1.6
	TA98+S9	87.10	.03	2.29	1.0
	TA100	87.10	N.A.	N.A.	N.A.
	TA100+S9	87.10	N.A.	N.A.	N.A.
12-May-1982					
	TA98	90.80	.01	2.47	1.5
	TA98+S9	90.80	.21	2.07	1.5
	TA100	90.80	-.67	4.81	1.1
	TA100+S9	90.80	-.33	4.58	1.2

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		EEWTP Finished Water (Phase IB, continued)			
18-May-1982					
	TA98	90.80	-.29	1.02	1.0
	TA98+S9	90.80	-.13	1.49	1.
	TA100	90.80	3.42	5.66	1.3
	TA100+S9	90.80	.69	5.87	1.3
19-May-1982					
	TA98	109.80	.10	1.05	1.5
	TA98+S9	109.80	.11	.99	1.
	TA100	109.80	1.76	4.66	1.4
	TA100+S9	109.80	.77	5.39	1.4
25-May-1982					
	TA98	75.70	.09	1.57	1.1
	TA98+S9	75.70	-1.03	1.69	1.0
	TA100	75.70	1.20	3.21	1.0
	TA100+S9	75.70	-3.39	5.57	.9
26-May-1982					
	TA98	68.10	-.67	1.17	1.
	TA98+S9	68.10	-1.49	2.02	1.0
	TA100	68.10	-4.03	5.64	1.0
	TA100+S9	68.10	-1.90	4.71	1.1
2-Jun-1982					
	TA98	113.60	-.15	1.39	1.0
	TA98+S9	113.60	-.02	1.35	1.3
	TA100	113.60	-.72	4.09	.9
	TA100+S9	113.60	-3.65	3.85	.9
15-Jun-1982					
	TA98	71.90	6.64	2.25	3.1
	TA98	71.90	.22	1.24	1.1
	TA98+S9	71.90	1.53	1.98	1.3
	TA98+S9	71.90	.86	1.92	1.2
	TA100	71.90	19.83	6.95	1.7
	TA100	71.90	-3.35	5.25	.9
	TA100+S9	71.90	10.14	5.67	1.4
	TA100+S9	71.90	-2.61	4.64	.9
16-Jun-1982					
	TA98	106.00	-.48	1.23	1.
	TA98+S9	106.00	.14	1.42	1.5
	TA100	106.00	.74	4.14	1.0
	TA100+S9	106.00	-.09	2.34	1.0
22-Jun-1982					
	TA98	94.60	-.03	1.26	1.2
	TA98+S9	94.60	-.94	1.39	1.1
	TA100	94.60	-.80	3.77	1.0
	TA100+S9	94.60	.42	3.39	1.1
29-Jun-1982					
	TA98	109.80	.02	.96	1.2
	TA98+S9	109.80	.08	.91	1.0
	TA100	109.80	.72	3.16	1.0
	TA100+S9	109.80	1.44	1.79	1.1

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 %[1] Confidence Interval	Mutagenic Ratio
		EEWTP Finished Water (Phase IIA)			
28-Jul-1982					
	TA98	90.80	.79	1.31	1.1
	TA98+S9	90.80	-.84	.67	1.
	TA100	90.80	2.72	4.10	1.2
	TA100+S9	90.80	-2.45	2.36	1.
3-Aug-1982					
	TA98	68.10	.08	1.32	1.1
	TA98+S9	68.10	-.30	2.15	1.1
	TA100	68.10	-.10	5.92	1.0
	TA100+S9	68.10	-.19	4.03	1.0
11-Aug-1982					
	TA98	87.10	.86	1.93	1.1
	TA98+S9	87.10	2.31	1.31	1.7
	TA100	87.10	-2.33	4.32	1.1
	TA100+S9	87.10	-1.13	3.14	.9
18-Aug-1982					
	TA98	98.40	.78	1.95	1.1
	TA98+S9	98.40	1.25	1.06	1.5
	TA100	98.40	.63	2.79	1.1
	TA100+S9	98.40	.11	4.20	1.1
31-Aug-1982					
	TA98	90.80	.72	1.28	1.4
	TA98+S9	90.80	.42	1.57	1.2
	TA100	90.80	-1.55	7.27	1.2
	TA100+S9	90.80	-2.11	5.67	1.0
1-Sep-1982					
	TA98	83.30	.83	.86	1.3
	TA98+S9	83.30	1.21	1.08	1.3
	TA100	83.30	-.67	6.06	1.1
	TA100+S9	83.30	-.54	4.68	1.0
14-Sep-1982					
	TA98	113.60	.38	1.67	1.6
	TA98+S9	113.60	-.31	.91	1.0
	TA100	113.60	-.32	3.44	1.
	TA100+S9	113.60	-3.85	2.59	1.0
21-Sep-1982					
	TA98	117.30	.84	1.73	1.3
	TA98+S9	117.30	1.05	1.31	1.3
	TA100	117.30	3.16	2.86	1.2
	TA100+S9	117.30	1.04	5.47	1.2
22-Sep-1982					
	TA98	83.30	1.83	1.34	1.3
	TA98+S9	83.30	.91	1.61	1.4
	TA100	83.30	-1.54	3.14	.9
	TA100+S9	83.30	4.36	3.21	1.2
6-Oct-1982					
	TA98	113.60	-.87	1.34	1.1
	TA98+S9	113.60	1.07	1.28	1.3
	TA100	113.60	.48	3.39	1.2
	TA100+S9	113.60	.06	4.73	1.4
19-Oct-1982					
	TA98	106.00	1.23	1.52	1.7
	TA98+S9	106.00	.32	1.21	1.1
	TA100	106.00	3.56	3.22	1.2
	TA100+S9	106.00	3.37	3.42	1.2
2-Nov-1982					
	TA98	71.90	1.51	.92	1.6
	TA98+S9	71.90	1.51	1.53	1.4
	TA100	71.90	-1.77	2.46	1.
	TA100+S9	71.90	2.64	5.47	1.1
16-Nov-1982					
	TA98	107.90	-.67	1.25	.9
	TA98+S9	107.90	N.A.	N.A.	N.A.
	TA100	107.90	-3.99	2.74	1.1
	TA100+S9	107.90	N.A.	N.A.	N.A.
30-Nov-1982					
	TA98	83.30	.93	1.48	1.3
	TA98+S9	83.30	1.78	1.18	1.7
	TA100	83.30	2.31	5.76	1.3
	TA100+S9	83.30	4.63	5.84	1.4
14-Dec-1982					
	TA98	56.80	-.27	1.01	.9
	TA98+S9	56.80	-.56	1.53	1.2
	TA100	56.80	4.93	5.35	1.8
	TA100+S9	56.80	1.34	5.74	1.5

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 %[1] Confidence Interval	Mutagenic Ratio
		EEWTP Finished Water (Phase IIA, continued)			
29-Dec-1982					
	TA98	83.20	-.47	1.04	.9
	TA98+S9	83.20	-.99	1.17	1.2
	TA100	83.20	-3.92	5.51	1.
	TA100+S9	83.20	-2.45	4.80	1.0
11-Jan-1983					
	TA98	117.30	-.26	.78	1.0
	TA98+S9	117.30	.22	.58	1.1
	TA100	117.30	-5.41	3.24	1.
	TA100+S9	117.30	-1.46	4.99	1.
25-Jan-1983					
	TA98	49.20	.99	2.48	1.7
	TA98+S9	49.20	-.24	2.12	1.1
	TA100	49.20	-7.64	7.11	.9
	TA100+S9	49.20	5.42	7.18	1.2
7-Feb-1983					
	TA98	53.00	N.A.	N.A.	N.A.
	TA98+S9	53.00	N.A.	N.A.	N.A.
	TA100	53.00	N.A.	N.A.	N.A.
	TA100+S9	53.00	N.A.	N.A.	N.A.
18-Feb-1983					
	TA98	71.90	.88	1.14	1.6
	TA98+S9	71.90	1.0	1.30	1.6
	TA100	71.90	N.A.	N.A.	N.A.
	TA100+S9	71.90	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		WTP 1 Finished Water			
9-Jun-1981					
	TA98	3.80	74.77	53.44	1.7
	TA98+S9	3.80	-7.15	73.97	1.0
	TA100	3.80	376.25	532.40	1.2
	TA100+S9	3.80	191.30	717.60	1.3
18-Jun-1981					
	TA98	4.00	-69.98	157.21	.7
	TA98+S9	4.00	56.13	193.26	1.1
	TA100	4.00	162.23	185.72	1.2
	TA100+S9	4.00	111.28	254.31	1.1
9-Jul-1981					
	TA98	111.00	34.26	5.08	5.7
	TA98+S9	111.00	N.A.	N.A.	N.A.
	TA100	111.00	127.72	14.98	3.2
	TA100+S9	111.00	N.A.	N.A.	N.A.
16-Jul-1981					
	TA98	105.00	20.97	4.43	3.2
	TA98+S9	105.00	3.19	1.81	2.9
	TA100	105.00	73.10	21.64	2.0
	TA100+S9	105.00	26.22	5.15	2.0
22-Jul-1981					
	TA98	90.00	10.16	1.97	2.6
	TA98+S9	90.00	7.09	4.51	2.0
	TA100	90.00	54.72	15.42	2.1
	TA100+S9	90.00	27.77	12.72	1.6
6-Aug-1981					
	TA98	88.90	12.37	4.16	3.5
	TA98+S9	88.90	5.62	2.37	2.7
	TA100	88.90	62.23	10.14	5.4
	TA100+S9	88.90	21.20	7.17	1.9
14-Aug-1981					
	TA98	82.00	17.42	5.28	7.3
	TA98+S9	82.00	9.28	8.30	4.1
	TA100	82.00	38.92	9.34	2.6
	TA100+S9	82.00	25.81	7.99	2.2
21-Aug-1981					
	TA98	79.00	17.41	2.20	5.9
	TA98+S9	79.00	13.13	4.89	4.7
	TA100	79.00	16.43	7.45	1.9
	TA100+S9	79.00	5.97	9.96	1.7
28-Aug-1981					
	TA98	90.00	24.32	6.42	8.4
	TA98+S9	90.00	14.85	6.71	5.2
	TA100	90.00	50.84	30.99	4.2
	TA100+S9	90.00	45.70	9.14	3.9
4-Sep-1981					
	TA98	78.00	26.39	5.74	8.2
	TA98+S9	78.00	32.06	3.77	9.6
	TA100	78.00	54.52	5.85	3.0
	TA100+S9	78.00	37.77	6.55	2.4
18-Sep-1981					
	TA98	91.00	2.84	1.73	1.8
	TA98+S9	91.00	3.11	1.38	2.0
	TA100	91.00	13.25	4.98	1.6
	TA100+S9	91.00	6.36	4.12	1.3
25-Sep-1981					
	TA98	92.00	1.42	2.09	1.1
	TA98+S9	92.00	-.16	2.40	1.2
	TA100	92.00	7.14	6.08	1.4
	TA100+S9	92.00	2.90	5.44	1.4
2-Oct-1981					
	TA98	87.00	8.43	1.75	3.3
	TA98+S9	87.00	5.63	2.45	1.9
	TA100	87.00	N.A.	N.A.	N.A.
	TA100+S9	87.00	N.A.	N.A.	N.A.
6-Oct-1981					
	TA98	90.00	6.49	6.92	1.9
	TA98+S9	90.00	11.74	2.91	3.6
	TA100	90.00	33.45	6.28	2.8
	TA100+S9	90.00	20.78	5.02	2.1
13-Oct-1981					
	TA98	76.00	6.32	2.64	2.4
	TA98+S9	76.00	2.20	1.10	1.4
	TA100	76.00	N.A.	N.A.	N.A.
	TA100+S9	76.00	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 %[1] Confidence Interval	Mutagenic Ratio
		WTP 1 Finished Water (continued)			
22-Oct-1981					
	TA98	72.00	7.75	3.87	3.5
	TA98+S9	72.00	7.08	3.70	3.2
	TA100	72.00	15.57	4.93	1.5
	TA100+S9	72.00	15.20	6.55	1.6
27-Oct-1981					
	TA98	83.00	2.63	2.60	2.0
	TA98+S9	83.00	3.76	3.20	1.5
	TA100	83.00	20.65	7.03	1.8
	TA100+S9	83.00	9.54	7.00	1.4
5-Nov-1981					
	TA98	60.60	-.70	7.77	1.4
	TA98+S9	60.60	3.59	3.88	1.8
	TA100	60.60	18.61	7.41	2.4
	TA100+S9	60.60	14.28	4.08	2.1
10-Nov-1981					
	TA98	47.30	8.18	5.00	3.2
	TA98+S9	47.30	2.52	7.22	2.1
	TA100	47.30	8.31	10.26	1.6
	TA100+S9	47.30	10.17	12.09	1.6
17-Nov-1981					
	TA98	72.00	1.73	2.50	1.8
	TA98+S9	72.00	.75	1.95	1.1
	TA100	72.00	-.93	4.54	1.1
	TA100+S9	72.00	4.93	9.38	1.3
24-Nov-1981					
	TA98	42.00	.90	2.19	1.7
	TA98+S9	42.00	-7.27	8.39	1.3
	TA100	42.00	-.87	3.57	1.1
	TA100+S9	42.00	2.37	43.66	1.4
8-Dec-1981					
	TA98	87.00	1.18	1.14	1.6
	TA98+S9	87.00	1.29	1.06	1.3
	TA100	87.00	7.37	9.18	1.4
	TA100+S9	87.00	3.07	4.49	1.1
15-Dec-1981					
	TA98	70.00	N.A.	N.A.	N.A.
	TA98+S9	70.00	N.A.	N.A.	N.A.
	TA100	70.00	N.A.	N.A.	N.A.
	TA100+S9	70.00	N.A.	N.A.	N.A.
22-Dec-1981					
	TA98	94.60	N.A.	N.A.	N.A.
	TA98+S9	94.60	N.A.	N.A.	N.A.
	TA100	94.60	N.A.	N.A.	N.A.
	TA100+S9	94.60	N.A.	N.A.	N.A.
29-Dec-1981					
	TA98	73.40	3.65	1.32	1.9
	TA98+S9	73.40	.34	1.88	1.3
	TA100	73.40	11.16	6.11	1.3
	TA100+S9	73.40	6.66	5.34	1.2
5-Jan-1982					
	TA98	68.10	2.50	2.13	1.7
	TA98+S9	68.10	1.56	2.05	1.3
	TA100	68.10	8.28	5.63	1.3
	TA100+S9	68.10	-2.06	6.65	1.1
12-Jan-1982					
	TA98	121.10	3.41	.88	2.5
	TA98+S9	121.10	2.54	.97	2.5
	TA100	121.10	6.48	3.06	1.3
	TA100+S9	121.10	8.06	1.30	1.4
27-Jan-1982					
	TA98	77.60	-.86	6.20	1.2
	TA98+S9	77.60	.98	5.82	1.4
	TA100	77.60	-4.84	4.96	1.0
	TA100+S9	77.60	-1.25	7.89	1.1
2-Feb-1982					
	TA98	189.20	N.A.	N.A	N.A.
	TA98+S9	189.20	N.A.	N.A.	N.A.
	TA100	189.20	2.20	2.24	1.1
	TA100+S9	189.20	1.63	1.84	1.2
10-Feb-1982					
	TA98	83.30	3.85	1.66	2.2
	TA98+S9	83.30	.96	2.30	1.2
	TA100	83.30	11.84	3.91	1.4
	TA100+S9	83.30	1.89	4.30	1.1

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % Confidence Interval[1]	Mutagenic Ratio
WTP 1 Finished Water (continued)					
16-Feb-1982					
	TA98	87.10	N.A.	N.A.	N.A.
	TA98+S9	87.10	N.A.	N.A.	N.A.
	TA100	87.10	N.A.	N.A.	N.A.
	TA100+S9	87.10	N.A.	N.A.	N.A.
23-Feb-1982					
	TA98	106.00	.38	1.23	1.2
	TA98+S9	106.00	2.05	1.10	1.6
	TA100	106.00	.76	5.99	1.2
	TA100+S9	106.00	2.37	3.36	1.2
24-Feb-1982					
	TA98	109.80	1.64	1.52	1.7
	TA98+S9	109.80	1.54	1.39	1.5
	TA100	109.80	4.44	5.02	1.3
	TA100+S9	109.80	1.52	4.24	1.2
2-Mar-1982					
	TA98	41.60	N.A.	N.A.	N.A.
	TA98+S9	41.60	N.A.	N.A.	N.A.
	TA100	41.60	13.84	7.34	1.3
	TA100+S9	41.60	1.49	[illegible].86	1.1
3-Mar-1982					
	TA98	113.60	N.A.	N.A.	N.A.
	TA98+S9	113.60	N.A.	N.A.	N.A.
	TA100	113.60	2.46	1.41	1.1
	TA100+S9	113.60	2.58	3.82	1.1
10-Mar-1982					
	TA98	94.60	N.A.	N.A.	N.A.
	TA98+S9	94.60	N.A.	N.A.	N.A.
	TA100	94.60	3.67	3.62	1.2
	TA100+S9	94.60	3.56	4.39	1.1
16-Mar-1982					
	TA98	98.40	.41	1.22	1.1
	TA98+S9	98.40	1.90	.81	1.6
	TA100	98.40	6.59	4.38	1.3
	TA100+S9	98.40	.63	3.97	1.0
17-Mar-1982					
	TA98	71.90	2.02	1.68	1.4
	TA98+S9	71.90	1.47	.91	1.3
	TA100	71.90	4.65	7.53	1.2
	TA100+S9	71.90	.33	4.27	1.
23-Mar-1982					
	TA98	121.10	1.76	1.07	1.7
	TA98+S9	121.10	1.97	.90	1.8
	TA100	121.10	7.50	2.80	1.5
	TA100+S9	121.10	6.79	3.16	1.4
24-Mar-1982					
	TA98	90.80	-.07	1.50	1.2
	TA98+S9	90.80	.41	1.13	1.3
	TA100	90.80	5.07	2.49	1.2
	TA100+S9	90.80	2.66	2.96	1.1
30-Mar-1982					
	TA98	45.40	.76	3.23	1.1
	TA98	73.80	1.19	1.83	1.4
	TA98+S9	45.40	-.80	2.33	.8
	TA98+S9	73.80	.45	1.56	1.3
	TA100	45.40	2.27	5.95	1.0
	TA100	73.80	3.44	6.90	1.2
	TA100+S9	45.40	4.85	15.66	1.4
	TA100+S9	73.80	3.72	7.71	1.3
31-Mar-1982					
	TA98	98.40	1.67	1.42	1.8
	TA98+S9	98.40	3.92	1.57	2.6
	TA100	98.40	2.17	3.49	1.2
	TA100+S9	98.40	7.81	2.83	1.5
6-Apr-1982					
	TA98	109.80	3.57	1.11	2.7
	TA98+S9	109.80	1.13	1.52	1.4
	TA100	109.80	4.78	2.41	1.3
	TA100+S9	109.80	.69	4.49	1.2
7-Apr-1982					
	TA98	87.10	5.17	1.59	3.0
	TA98+S9	87.10	2.55	1.82	1.7
	TA100	87.10	19.09	4.12	1.9
	TA100+S9	87.10	6.73	3.01	1.4
20-Apr-1982					
	TA98	90.80	2.93	.98	1.9
	TA98+S9	90.80	1.61	1.47	1.4
	TA100	90.80	3.68	3.48	1.2
	TA100+S9	90.80	2.96	5.72	1.1

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
WTP 1 Finished Water (continued)					
21-Apr-1982					
	TA98	109.80	2.49	1.28	2.3
	TA98+S9	109.80	.61	.89	1.3
	TA100	109.80	.30	4.53	1.0
	TA100+S9	109.80	.59	3.21	1.1
27-Apr-1982					
	TA98	102.20	2.55	.77	1.9
	TA98+S9	102.20	1.34	1.38	1.4
	TA100	102.20	6.96	3.21	1.3
	TA100+S9	102.20	5.14	5.27	1.4
27-Apr-1982 (2nd set)					
	TA98	109.80	5.28	2.11	3.0
	TA98+S9	109.80	4.14	1.49	2.2
	TA100	109.80	10.95	3.12	1.5
	TA100+S9	109.80	9.66	3.20	1.6
28-Apr-1982					
	TA98	113.60	1.46	.65	1.5
	TA98+S9	113.60	.87	1.45	1.2
	TA100	113.60	3.52	3.45	1.2
	TA100+S9	113.60	.71	3.91	1.3
4-May-1982					
	TA98	113.60	3.96	1.29	2.9
	TA98+S9	113.60	8.20	12.73	8.0
	TA100	113.60	9.13	3.89	1.6
	TA100+S9	113.60	6.97	3.98	1.4
5-May-1982					
	TA98	113.60	1.73	1.27	1.8
	TA98+S9	113.60	8.66	11.77	5.9
	TA100	113.60	9.38	3.05	1.6
	TA100+S9	113.60	3.19	4.24	1.2
11-May-1982					
	TA98	102.20	5.01	1.44	3.6
	TA98+S9	102.20	4.19	1.27	2.9
	TA100	102.20	13.17	4.89	1.8
	TA100+S9	102.20	8.53	3.08	1.5
12-May-1982					
	TA98	94.60	4.64	1.28	3.1
	TA98+S9	94.60	1.69	1.62	1.7
	TA100	94.60	8.79	4.70	1.5
	TA100+S9	94.60	5.10	3.84	1.3
18-May-1982					
	TA98	56.80	2.68	2.37	1.5
	TA98+S9	56.80	.82	3.02	1.3
	TA100	56.80	.20	5.83	1.0
	TA100+S9	56.80	-3.43	6.45	1.
19-May-1982					
	TA98	90.80	-.12	.78	1.3
	TA98+S9	90.80	-1.18	1.18	1.
	TA100	90.80	10.03	3.61	1.5
	TA100+S9	90.80	5.98	5.48	1.4
25-May-1982					
	TA98	113.60	.68	1.22	1.5
	TA98+S9	113.60	-.19	1.24	1.2
	TA100	113.60	1.30	1.84	1.1
	TA100+S9	113.60	1.96	2.16	1.1
26-May-1982					
	TA98	71.90	-.77	1.39	.9
	TA98+S9	71.90	-.65	2.17	.8
	TA100	71.90	3.58	3.92	1.1
	TA100+S9	71.90	1.67	4.04	1.1
2-Jun-1982					
	TA98	75.70	3.77	1.32	2.0
	TA98+S9	75.70	1.52	1.94	1.8
	TA100	75.70	10.47	6.02	1.3
	TA100+S9	75.70	4.15	6.53	1.1
15-Jun-1982					
	TA98	94.60	6.11	1.36	3.8
	TA98+S9	94.60	2.29	2.05	2.0
	TA100	94.60	6.76	3.47	1.1
	TA100+S9	94.60	6.14	4.92	1.3
16-Jun-1982					
	TA98	92.70	15.05	1.64	7.9
	TA98+S9	92.70	10.70	1.47	4.4
	TA100	92.70	22.90	4.24	2.1
	TA100+S9	92.70	13.48	3.93	1.7

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		WTP 1 Finished Water (continued)			
22-Jun-1982					
	TA98	106.00	1.33	1.49	1.8
	TA98+S9	106.00	.68	1.15	1.3
	TA100	106.00	2.37	3.61	1.2
	TA100+S9	106.00	.78	2.64	1.1
23-Jun-1982					
	TA98	75.70	6.08	1.42	3.1
	TA98+S9	75.70	4.09	1.36	2.0
	TA100	75.70	9.01	4.15	1.3
	TA100+S9	75.70	8.16	4.31	1.4
29-Jun-1982					
	TA98	71.90	2.13	1.09	1.5
	TA98+S9	71.90	1.10	1.33	1.2
	TA100	71.90	5.49	5.67	1.2
	TA100+S9	71.90	1.48	4.40	1.1
7-Jul-1982					
	TA98	98.40	1.93	1.61	1.6
	TA98+S9	98.40	-.16	1.68	1.4
	TA100	98.40	-.41	2.99	1.1
	TA100+S9	98.40	.21	3.17	1.1
13-Jul-1982					
	TA98	71.90	1.76	1.91	1.6
	TA98+S9	71.90	-.28	1.37	1.1
	TA100	71.90	1.17	5.80	1.0
	TA100+S9	71.90	2.82	5.85	1.1
14-Jul-1982					
	TA98	113.60	1.73	.98	1.3
	TA98+S9	113.60	1.09	.87	1.4
	TA100	113.60	3.21	2.20	1.2
	TA100+S9	113.60	2.55	3.30	1.2
20-Jul-1982					
	TA98	83.30	.49	.70	1.2
	TA98+S9	83.30	1.42	1.41	1.5
	TA100	83.30	-1.13	6.09	1.2
	TA100+S9	83.30	1.14	3.35	1.0
3-Aug-1982					
	TA98	83.30	2.39	1.30	1.7
	TA98+S9	83.30	-.07	1.19	1.1
	TA100	83.30	3.22	3.69	1.1
	TA100+S9	83.30	.47	3.27	1.0
18-Aug-1982					
	TA98	83.30	2.52	1.36	1.8
	TA98+S9	83.30	.46	1.25	1.2
	TA100	83.30	10.37	5.50	1.5
	TA100+S9	83.30	5.42	5.25	1.2
14-Sep-1982					
	TA98	106.00	4.10	1.61	3.1
	TA98+S9	106.00	2.68	1.28	1.9
	TA100	106.00	14.08	3.54	1.7
	TA100+S9	106.00	8.39	3.81	1.4
21-Sep-1982					
	TA98	106.00	2.01	1.43	1.6
	TA98+S9	106.00	2.56	1.61	1.7
	TA100	106.00	7.11	3.64	1.5
	TA100+S9	106.00	7.64	2.97	1.4
22-Sep-1982					
	TA98	132.50	-.01	2.28	1.
	TA98+S9	132.50	3.39	.99	1.9
	TA100	132.50	17.60	10.82	1.5
	TA100+S9	132.50	19.33	2.09	2.5
6-Oct-1982					
	TA98	94.60	2.94	1.75	2.5
	TA98+S9	94.60	2.75	1.23	2.0
	TA100	94.60	13.03	4.35	1.8
	TA100+S9	94.60	5.44	2.08	1.2
19-Oct-1982					
	TA98	113.60	4.85	.75	4.2
	TA98+S9	113.60	2.93	1.40	2.3
	TA100	113.60	22.38	2.48	2.5
	TA100+S9	113.60	8.82	4.98	1.5
2-Nov-1982					
	TA98	79.50	-.21	1.60	1.5
	TA98+S9	79.50	-.69	1.22	.9
	TA100	79.50	5.80	4.46	1.2
	TA100+S9	79.50	2.43	5.41	1.1

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
WTP 1 Finished Water (continued)					
16-Nov-1982					
	TA98	113.60	9.13	1.98	5.0
	TA98+S9	113.60	N.A.	N.A.	N.A.
	TA100	113.60	21.62	3.11	2.2
	TA100+S9	113.60	N.A.	N.A.	N.A.
30-Nov-1982					
	TA98	90.80	1.07	1.22	1.4
	TA98+S9	90.80	2.15	1.01	2.0
	TA100	90.80	3.94	3.05	1.3
	TA100+S9	90.80	5.33	2.23	1.3
14-Dec-1982					
	TA98	68.10	6.68	3.28	2.2
	TA98+S9	68.10	8.82	2.85	2.5
	TA100	68.10	23.56	8.13	1.9
	TA100+S9	68.10	11.20	6.29	1.3
11-Jan-1983					
	TA98	107.90	.05	1.00	1.3
	TA98+S9	107.90	-.16	.45	1.2
	TA100	107.90	16.30	7.42	1.7
	TA100+S9	107.90	2.07	6.79	1.1
25-Jan-1983					
	TA98	83.30	7.66	1.31	4.2
	TA98+S9	83.30	8.29	2.10	3.3
	TA100	83.30	9.05	5.54	1.4
	TA100+S9	83.30	9.04	4.38	1.5
7-Feb-1983					
	TA98	49.20	N.A.	N.A.	N.A.
	TA98+S9	49.20	N.A.	N.A.	N.A.
	TA100	49.20	N.A.	N.A.	N.A.
	TA100+S9	49.20	N.A.	N.A.	N.A.
15-Feb-1983					
	TA98	68.13	1.11	.99	1.5
	TA98+S9	68.13	1.57	1.51	1.6
	TA100	68.13	N.A.	N.A.	N.A.
	TA100+S9	68.13	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 %[1] Confidence Interval	Mutagenic Ratio
		WTP 2 Finished Water			
18-Jun-1981					
	TA98	4.00	-32.66	97.82	.8
	TA98+S9	4.00	14.67	169.42	1.
	TA100	4.00	-47.59	226.06	1.2
	TA100+S9	4.00	237.03	255.61	1.2
29-Jun-1981					
	TA98	100.00	19.30	6.22	2.6
	TA98+S9	100.00	9.54	6.89	1.5
	TA100	100.00	119.49	8.70	3.9
	TA100+S9	100.00	42.08	22.38	2.0
9-Jul-1981					
	TA98	111.00	30.97	2.53	5.7
	TA98+S9	111.00	N.A.	N.A.	N.A.
	TA100	111.00	178.30	15.68	4.3
	TA100+S9	111.00	N.A.	N.A.	N.A.
16-Jul-1981					
	TA98	87.00	43.56	7.71	4.7
	TA98+S9	87.00	4.98	3.01	3.5
	TA100	87.00	151.62	18.63	2.8
	TA100+S9	87.00	56.28	6.72	2.7
22-Jul-1981					
	TA98	77.40	18.39	2.68	3.6
	TA98+S9	77.40	5.01	5.15	1.6
	TA100	77.40	105.45	6.55	3.0
	TA100+S9	77.40	32.23	16.08	1.6
6-Aug-1981					
	TA98	88.95	6.08	2.93	2.4
	TA98+S9	88.95	3.50	.78	2.0
	TA100	88.95	16.56	10.90	2.5
	TA100+S9	88.95	-2.02	5.05	1.2
14-Aug-1981					
	TA98	90.00	5.71	4.13	3.5
	TA98+S9	90.00	-.54	2.75	1.9
	TA100	90.00	31.51	4.74	2.5
	TA100+S9	90.00	15.83	7.13	1.9
21-Aug-1981					
	TA98	64.00	3.07	2.42	1.6
	TA98+S9	64.00	.26	2.50	.9
	TA100	64.00	8.88	10.33	1.6
	TA100+S9	64.00	4.78	8.38	1.4
28-Aug-1981					
	TA98	94.00	13.52	2.40	5.7
	TA98+S9	94.00	13.32	3.46	5.2
	TA100	94.00	41.76	5.24	3.5
	TA100+S9	94.00	27.73	4.53	2.9
4-Sep-1981					
	TA98	99.00	41.33	6.29	14.8
	TA98+S9	99.00	25.38	2.78	8.9
	TA100	99.00	70.24	10.30	4.2
	TA100+S9	99.00	55.78	14.67	3.6
18-Sep-1981					
	TA98	86.00	2.08	1.96	1.6
	TA98+S9	86.00	3.11	1.69	1.8
	TA100	86.00	7.56	4.63	1.3
	TA100+S9	86.00	3.23	5.76	1.1
25-Sep-1981					
	TA98	86.00	5.73	2.69	1.9
	TA98+S9	86.00	2.18	3.64	1.4
	TA100	86.00	19.74	9.70	1.7
	TA100+S9	86.00	14.29	7.66	1.5
2-Oct-1981					
	TA98	95.00	12.56	2.86	4.6
	TA98+S9	95.00	7.83	2.31	2.6
	TA100	95.00	N.A.	N.A.	N.A.
	TA100+S9	95.00	N.A.	N.A.	N.A.
6-Oct-1981					
	TA98	86.00	7.37	2.06	2.8
	TA98+S9	86.00	4.39	3.08	1.9
	TA100	86.00	43.86	9.94	3.3
	TA100+S9	86.00	30.70	6.85	2.5
13-Oct-1981					
	TA98	95.00	9.56	2.38	4.1
	TA98+S9	95.00	4.96	3.22	1.9
	TA100	95.00	N.A.	N.A.	N.A.
	TA100+S9	95.00	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		WTP 2 Finished Water (continued)			
22-Oct-1981					
	TA98	68.00	10.37	4.80	3.1
	TA98+S9	68.00	12.35	6.60	3.1
	TA100	68.00	14.81	7.68	1.3
	TA100+S9	68.00	14.41	14.94	1.3
27-Oct-1981					
	TA98	101.00	9.27	2.81	5.4
	TA98+S9	101.00	8.33	1.75	4.5
	TA100	101.00	31.23	6.43	2.4
	TA100+S9	101.00	16.01	4.73	1.9
5-Nov-1981					
	TA98	87.10	2.16	2.57	1.4
	TA98+S9	87.10	.53	2.14	1.0
	TA100	87.10	-2.63	7.21	1.2
	TA100+S9	87.10	1.22	4.77	1.3
10-Nov-1981					
	TA98	58.70	-7.80	19.08	1.1
	TA98+S9	58.70	-19.08	10.37	.6
	TA100	58.70	8.12	5.63	1.8
	TA100+S9	58.70	2.76	7.91	1.5
17-Nov-1981					
	TA98	57.00	3.98	2.64	2.4
	TA98+S9	57.00	4.25	3.33	1.6
	TA100	57.00	16.99	4.47	1.3
	TA100+S9	57.00	9.02	11.10	1.4
24-Nov-1981					
	TA98	57.00	1.17	2.24	1.6
	TA98+S9	57.00	.85	3.52	1.2
	TA100	57.00	-6.18	4.24	1.0
	TA100+S9	57.00	5.45	12.74	1.4
8-Dec-1981					
	TA98	97.00	1.19	1.12	1.7
	TA98+S9	97.00	3.07	1.72	1.9
	TA100	97.00	5.75	4.31	1.2
	TA100+S9	97.00	4.95	2.74	1.2
15-Dec-1981					
	TA98	90.80	N.A.	N.A.	N.A.
	TA98+S9	90.80	N.A.	N.A.	N.A.
	TA100	90.80	N.A.	N.A.	N.A.
	TA100+S9	90.80	N.A.	N.A.	N.A.
22-Dec-1981					
	TA98	92.70	N.A.	N.A.	N.A.
	TA98+S9	92.70	N.A.	N.A.	N.A.
	TA100	92.70	N.A.	N.A.	N.A.
	TA100+S9	92.70	N.A.	N.A.	N.A.
29-Dec-1981					
	TA98	64.30	2.42	1.80	1.5
	TA98+S9	64.30	1.29	1.42	1.3
	TA100	64.30	7.61	8.05	1.2
	TA100+S9	64.30	1.60	7.27	1.0
12-Jan-1982					
	TA98	113.60	4.00	.86	3.2
	TA98+S9	113.60	4.38	.89	4.2
	TA100	113.60	7.82	4.18	1.4
	TA100+S9	113.60	7.05	2.58	1.4
2-Feb-1982					
	TA98	53.00	5.43	95.68	1.3
	TA98+S9	53.00	N.A.	N.A.	1.2
	TA100	53.00	7.45	13.01	1.1
	TA100+S9	53.00	5.86	5.84	1.2
9-Feb-1982					
	TA98	60.60	9.48	29.57	1.3
	TA98+S9	60.60	8.33	305.66	1.1
	TA100	60.60	35.67	16.90	1.4
	TA100+S9	60.60	24.40	43.01	1.3
16-Feb-1982					
	TA98	62.40	N.A.	N.A.	N.A.
	TA98+S9	62.40	N.A.	N.A.	N.A.
	TA100	62.40	N.A.	N.A.	N.A.
	TA100+S9	62.40	N.A.	N.A.	N.A.
23-Feb-1982					
	TA98	71.90	N.A.	N.A.	N.A.
	TA98+S9	71.90	N.A.	N.A.	N.A.
	TA100	71.90	N.A.	N.A.	N.A.
	TA100+S9	71.90	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 %[1] Confidence Interval	Mutagenic Ratio
		WTP 2 Finished Water (continued)			
24-Feb-1982					
	TA98	79.50	2.91	2.13	1.9
	TA98+S9	79.50	1.57	1.20	1.4
	TA100	79.50	10.72	5.84	1.4
	TA100+S9	79.50	7.36	6.24	1.3
2-Mar-1982					
	TA98	79.50	3.86	1.75	2.1
	TA98+S9	79.50	1.58	1.03	1.4
	TA100	79.50	16.61	7.61	1.6
	TA100+S9	79.50	9.00	6.56	1.4
3-Mar-1982					
	TA98	98.40	4.79	1.57	2.6
	TA98+S9	98.40	N.A.	N.A.	N.A.
	TA100	98.40	10.80	3.52	1.5
	TA100+S9	98.40	N.A.	N.A.	N.A.
9-Mar-1982					
	TA98	94.60	N.A.	N.A.	N.A.
	TA98+S9	94.60	N.A.	N.A.	N.A.
	TA100	94.60	1.26	4.82	1.1
	TA100+S9	94.60	1.83	4.31	1.1
17-Mar-1982					
	TA98	83.30	.96	1.88	1.2
	TA98+S9	83.30	1.57	2.03	1.5
	TA100	83.30	9.16	2.76	1.4
	TA100+S9	83.30	6.59	5.01	1.3
20-Mar-1982					
	TA98	83.30	2.68	1.43	1.7
	TA98+S9	83.30	1.16	1.64	1.4
	TA100	83.30	2.82	2.80	1.1
	TA100+S9	83.30	9.80	6.57	1.4
24-Mar-1982					
	TA98	102.20	2.50	2.05	1.7
	TA98+S9	102.20	2.94	.87	2.0
	TA100	102.20	8.81	3.13	1.4
	TA100+S9	102.20	5.87	5.77	1.4
30-Mar-1982					
	TA98	106.00	.68	1.25	1.4
	TA98+S9	106.00	1.59	1.51	1.6
	TA100	106.00	2.11	3.17	1.1
	TA100+S9	106.00	5.22	6.22	1.4
31-Mar-1982					
	TA98	87.10	6.94	1.52	3.8
	TA98+S9	87.10	5.34	1.67	3.1
	TA100	87.10	11.59	4.95	1.6
	TA100+S9	87.10	10.94	5.35	1.6
6-Apr-1982					
	TA98	87.10	3.60	1.52	2.3
	TA98+S9	87.10	2.18	1.44	1.6
	TA100	87.10	7.91	5.44	1.3
	TA100+S9	87.10	5.29	7.07	1.4
7-Apr-1982					
	TA98	53.00	3.58	1.98	1.9
	TA98+S9	53.00	1.39	3.07	1.7
	TA100	53.00	5.84	8.08	1.1
	TA100+S9	53.00	6.88	6.16	1.2
21-Apr-1982					
	TA98	98.40	1.18	1.55	1.7
	TA98+S9	98.40	-.86	2.70	1.7
	TA100	98.40	9.05	5.57	1.5
	TA100+S9	98.40	6.01	6.65	1.3
4-May-1982					
	TA98	87.10	2.87	1.60	2.0
	TA98+S9	87.10	15.20	13.33	5.1
	TA100	87.10	21.85	4.86	2.0
	TA100+S9	87.10	7.10	5.26	1.4
5-May-1982					
	TA98	113.60	4.41	1.26	2.7
	TA98+S9	113.60	1.40	2.00	1.3
	TA100	113.60	N.A.	N.A.	N.A.
	TA100+S9	113.60	N.A.	N.A.	N.A.
11-May-1982					
	TA98	113.60	8.03	1.85	3.7
	TA98+S9	113.60	6.23	1.64	2.3
	TA100	113.60	N.A.	N.A.	N.A.
	TA100+S9	113.60	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 %[1] Confidence Interval	Mutagenic Ratio
		WTP 2 Finished Water (continued)			
12-May-1982					
	TA98	94.60	7.07	1.09	4.1
	TA98+S9	94.60	2.82	1.36	1.8
	TA100	94.60	17.91	2.73	2.0
	TA100+S9	94.60	10.64	8.31	1.7
18-May-1982					
	TA98	113.60	2.79	1.43	2.1
	TA98+S9	113.60	1.62	1.57	1.5
	TA100	113.60	6.28	3.19	1.4
	TA100+S9	113.60	1.88	4.22	1.0
19-May-1982					
	TA98	113.60	1.03	.64	1.5
	TA98+S9	113.60	.76	1.33	1.3
	TA100	113.60	2.07	4.27	1.3
	TA100+S9	113.60	2.58	3.45	1.2
25-May-1982					
	TA98	121.10	5.04	1.20	3.0
	TA98+S9	121.10	2.47	1.24	1.9
	TA100	121.10	21.63	2.51	2.4
	TA100+S9	121.10	3.59	4.64	1.2
26-May-1982					
	TA98	68.10	1.99	1.90	1.5
	TA98+S9	68.10	.07	1.08	1.3
	TA100	68.10	.71	6.28	1.
	TA100+S9	68.10	-.47	7.18	1.
2-Jun-1982					
	TA98	113.60	3.30	1.15	2.3
	TA98+S9	113.60	3.00	1.85	2.4
	TA100	113.60	11.26	5.54	1.7
	TA100+S9	113.60	2.70	3.63	1.1
16-Jun-1982					
	TA98	83.30	4.45	1.84	2.7
	TA98+S9	83.30	.24	2.04	1.1
	TA100	83.30	22.89	4.64	2.0
	TA100+S9	83.30	3.67	2.59	1.2
22-Jun-1982					
	TA98	115.40	7.35	1.48	3.9
	TA98+S9	115.40	4.13	1.55	2.2
	TA100	115.40	27.97	4.83	2.8
	TA100+S9	115.40	14.78	3.84	1.9
23-Jun-1982					
	TA98	71.90	11.65	3.22	5.2
	TA98+S9	71.90	5.56	2.16	2.4
	TA100	71.90	8.24	7.24	1.4
	TA100+S9	71.90	9.21	5.96	1.4
29-Jun-1982					
	TA98	98.40	5.10	1.59	2.8
	TA98+S9	98.40	4.33	1.69	2.2
	TA100	98.40	8.64	2.81	1.5
	TA100+S9	98.40	7.65	5.24	1.4
7-Jul-1982					
	TA98	98.40	3.24	1.93	2.2
	TA98+S9	98.40	2.70	2.37	1.7
	TA100	98.40	10.40	3.69	1.6
	TA100+S9	98.40	7.53	4.44	1.4
13-Jul-1982					
	TA98	45.40	7.60	2.30	2.6
	TA98+S9	45.40	1.44	2.57	1.3
	TA100	45.40	15.06	9.90	1.3
	TA100+S9	45.40	12.05	9.01	1.3
14-Jul-1982					
	TA98	90.80	1.98	1.50	1.4
	TA98+S9	90.80	N.A.	N.A.	N.A.
	TA100	90.80	1.08	6.52	1.1
	TA100+S9	90.80	N.A.	N.A.	N.A.
20-Jul-1982					
	TA98	90.80	3.78	1.96	1.9
	TA98+S9	90.80	N.A.	N.A.	N.A.
	TA100	90.80	1.71	4.26	1.1
	TA100+S9	90.80	N.A.	N.A.	N.A.
27-Jul-1982					
	TA98	113.60	1.92	1.16	1.6
	TA98+S9	113.60	N.A.	N.A.	N.A.
	TA100	113.60	2.51	3.08	1.2
	TA100+S9	113.60	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 %[1] Confidence Interval	Mutagenic Ratio
WTP 2 Finished Water (continued)					
3-Aug-1982					
	TA98	90.80	.56	1.40	1.3
	TA98+S9	90.80	2.15	1.16	1.7
	TA100	90.80	.10	2.40	1.0
	TA100+S9	90.80	.13	3.89	1.1
18-Aug-1982					
	TA98	113.60	1.65	2.95	1.8
	TA98+S9	113.60	6.77	.95	4.1
	TA100	113.60	16.35	4.85	1.9
	TA100+S9	113.60	6.77	2.76	1.5
21-Sep-1982					
	TA98	106.00	6.49	1.48	4.4
	TA98+S9	106.00	3.48	1.30	2.2
	TA100	106.00	29.98	4.30	2.5
	TA100+S9	106.00	16.41	5.17	1.8
22-Sep-1982					
	TA98	117.30	1.67	1.26	1.6
	TA98+S9	117.30	1.90	1.64	1.6
	TA100	117.30	8.02	1.78	1.6
	TA100+S9	117.30	6.89	4.04	1.4
6-Oct-1982					
	TA98	132.50	9.19	1.82	7.9
	TA98+S9	132.50	6.88	1.08	4.6
	TA100	132.50	23.89	3.09	2.8
	TA100+S9	132.50	11.35	3.06	1.7
19-Oct-1982					
	TA98	79.50	1.05	2.07	1.6
	TA98+S9	79.50	.92	1.37	1.1
	TA100	79.50	3.55	6.12	1.1
	TA100+S9	79.50	.17	5.29	1.1
16-Nov-1982					
	TA98	100.30	2.94	1.49	2.1
	TA98+S9	100.30	N.A.	N.A.	N.A.
	TA100	100.30	5.10	6.10	1.2
	TA100+S9	100.30	N.A.	N.A.	N.A.
30-Nov-1982					
	TA98	71.90	.17	3.08	2.3
	TA98+S9	71.90	-.01	2.81	2.1
	TA100	71.90	.53	6.61	1.4
	TA100+S9	71.90	-2.91	6.47	1.4
14-Dec-1982					
	TA98	64.30	.97	1.14	1.2
	TA98+S9	64.30	3.49	2.07	1.5
	TA100	64.30	-3.77	18.17	1.9
	TA100+S9	64.30	-3.91	3.91	1.1
25-Jan-1983					
	TA98	49.20	11.36	2.14	4.0
	TA98+S9	49.20	13.70	2.23	3.2
	TA100	49.20	11.09	10.14	1.3
	TA100+S9	49.20	7.65	8.14	1.2
7-Feb-1983					
	TA98	113.50	N.A.	N.A.	N.A.
	TA98+S9	113.50	N.A.	N.A.	N.A.
	TA100	113.50	N.A.	N.A.	N.A.
	TA100+S9	113.50	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		WTP 3 Finished Water			
9-Jul-1981					
	TA98	84.00	15.85	5.43	2.9
	TA98+S9	84.00	N.A.	N.A.	N.A.
	TA100	84.00	69.66	13.58	2.0
	TA100+S9	84.00	N.A.	N.A.	N.A.
16-Jul-1981					
	TA98	84.00	26.50	8.87	3.2
	TA98+S9	84.00	3.44	1.97	2.8
	TA100	84.00	79.78	10.78	1.9
	TA100+S9	84.00	27.30	9.30	1.8
22-Jul-1981					
	TA98	84.00	8.35	2.96	2.4
	TA98+S9	84.00	3.77	2.49	1.5
	TA100	84.00	71.22	12.90	2.5
	TA100+S9	84.00	34.72	11.36	1.7
6-Aug-1981					
	TA98	88.90	8.34	3.62	2.6
	TA98+S9	88.90	7.42	3.88	2.7
	TA100	88.90	45.56	17.95	4.2
	TA100+S9	88.90	18.18	2.71	1.8
14-Aug-1981					
	TA98	79.00	3.41	1.75	2.3
	TA98+S9	79.00	3.53	2.05	2.1
	TA100	79.00	28.64	8.87	2.2
	TA100+S9	79.00	8.72	7.02	1.5
21-Aug-1981					
	TA98	68.00	5.66	2.16	2.4
	TA98+S9	68.00	5.11	3.18	2.1
	TA100	68.00	33.19	7.23	2.5
	TA100+S9	68.00	17.06	7.78	1.9
28-Aug-1981					
	TA98	56.00	11.03	4.14	3.3
	TA98+S9	56.00	3.37	2.47	1.8
	TA100	56.00	26.30	10.12	2.1
	TA100+S9	56.00	22.86	9.44	2.1
4-Sep-1981					
	TA98	84.00	10.27	2.90	3.7
	TA98+S9	84.00	8.94	3.18	3.3
	TA100	84.00	33.28	9.99	2.4
	TA100+S9	84.00	19.09	5.21	1.8
18-Sep-1981					
	TA98	90.00	1.57	2.64	1.9
	TA98+S9	90.00	2.29	3.51	2.5
	TA100	90.00	8.71	4.72	1.4
	TA100+S9	90.00	6.23	4.56	1.3
25-Sep-1981					
	TA98	86.00	-1.77	2.39	1.
	TA98+S9	86.00	-.46	2.85	1.2
	TA100	86.00	4.16	6.74	1.3
	TA100+S9	86.00	2.64	6.25	1.2
2-Oct-1981					
	TA98	72.00	6.65	5.51	2.4
	TA98+S9	72.00	5.22	3.06	1.7
	TA100	72.00	N.A.	N.A.	N.A.
	TA100+S9	72.00	N.A.	N.A.	N.A.
6-Oct-1981					
	TA98	56.00	9.96	3.12	2.7
	TA98+S9	56.00	10.95	3.50	2.4
	TA100	56.00	47.48	6.70	2.5
	TA100+S9	56.00	33.22	8.69	2.1
13-Oct-1981					
	TA98	76.00	2.47	2.16	1.4
	TA98+S9	76.00	-.95	2.34	.7
	TA100	76.00	N.A.	N.A.	N.A.
	TA100+S9	76.00	N.A.	N.A.	N.A.
22-Oct-1981					
	TA98	64.00	2.08	2.96	1.8
	TA98+S9	64.00	2.48	1.89	1.6
	TA100	64.00	2.16	9.95	1.2
	TA100+S9	64.00	7.04	3.88	1.2
27-Oct-1981					
	TA98	73.00	11.80	4.03	5.1
	TA98+S9	73.00	3.51	3.88	3.6
	TA100	73.00	40.11	1.67	2.2
	TA100+S9	73.00	21.14	8.07	1.9

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % Confidence Interval[1]	Mutagenic Ratio
		WTP 3 Finished Water (continued)			
5-Nov-1981					
	TA98	106.00	2.56	2.52	1.5
	TA98+S9	106.00	-3.66	2.89	1.0
	TA100	106.00	7.59	11.62	1.7
	TA100+S9	106.00	11.77	13.64	1.4
10-Nov-1981					
	TA98	87.10	3.67	3.49	2.0
	TA98+S9	87.10	6.12	4.94	1.6
	TA100	87.10	12.94	6.19	1.8
	TA100+S9	87.10	5.03	10.93	1.6
17-Nov-1981					
	TA98	55.00	4.52	2.82	2.2
	TA98+S9	55.00	1.82	3.20	1.2
	TA100	55.00	8.29	7.30	1.2
	TA100+S9	55.00	8.29	10.99	1.4
24-Nov-1981					
	TA98	61.00	2.15	3.17	2.0
	TA98+S9	61.00	2.24	2.25	1.3
	TA100	61.00	1.63	6.78	1.0
	TA100+S9	61.00	9.03	11.90	1.4
8-Dec-1981					
	TA98	72.00	1.55	.96	1.5
	TA98+S9	72.00	.51	2.33	1.2
	TA100	72.00	4.38	5.75	1.1
	TA100+S9	72.00	3.83	4.31	1.1
15-Dec-1981					
	TA98	71.90	N.A.	N.A.	N.A.
	TA98+S9	71.90	N.A.	N.A.	N.A.
	TA100	71.90	N.A.	N.A.	N.A.
	TA100+S9	71.90	N.A.	N.A.	N.A.
22-Dec-1981					
	TA98	87.10	1.27	1.84	1.4
	TA98+S9	87.10	-.67	1.61	1.4
	TA100	87.10	1.30	7.32	1.2
	TA100+S9	87.10	1.70	5.04	1.1
29-Dec-1981					
	TA98	53.40	.22	2.16	1.3
	TA98+S9	53.40	1.15	2.59	1.7
	TA100	53.40	-3.38	10.19	1.0
	TA100+S9	33.40	5.66	6.31	1.1
5-Jan-1982					
	TA98	49.20	4.04	1.78	1.8
	TA98+S9	49.20	2.97	1.95	1.6
	TA100	49.20	4.47	8.15	1.1
	TA100+S9	49.20	11.58	7.61	1.4
12-Jan-1982					
	TA98	94.60	.86	.82	1.4
	TA98+S9	94.60	.41	1.68	2.0
	TA100	94.60	2.46	3.14	1.1
	TA100+S9	94.60	-.16	3.30	1.2
27-Jan-1982					
	TA98	60.60	2.57	3.94	1.3
	TA98+S9	60.60	.45	3.06	1.1
	TA100	60.60	1.54	7.62	1.1
	TA100+S9	60.60	5.48	18.76	1.4
2-Feb-1982					
	TA98	83.30	4.35	4.84	1.6
	TA98+S9	83.30	3.90	7.95	1.4
	TA100	83.30	1.19	6.67	1.1
	TA100+S9	83.30	5.94	7.82	1.2
9-Feb-1982					
	TA98	68.10	8.11	39.78	1.4
	TA98+S9	68.10	N.A.	N.A.	N.A.
	TA100	68.10	45.42	2.97	2.4
	TA100+S9	68.10	7.57	21.51	1.2
23-Feb-1982					
	TA98	87.10	3.49	1.62	2.1
	TA98+S9	87.10	5.62	2.67	2.3
	TA100	87.10	11.49	4.00	1.5
	TA100+S9	87.10	8.23	4.53	1.3
2-Mar-1982					
	TA98	75.70	2.71	1.09	1.8
	TA98+S9	75.70	N.A.	N.A.	N.A.
	TA100	75.70	8.19	4.26	1.3
	TA100+S9	75.70	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		WTP 3 Finished Water (continued)			
3-Mar-1982					
	TA98	98.40	N.A.	N.A.	N.A.
	TA98+S9	98.40	N.A.	N.A.	N.A.
	TA100	98.40	4.58	4.30	1.2
	TA100+S9	98.40	-.58	5.47	1.
9-Mar-1982					
	TA98	94.60	N.A.	N.A.	N.A.
	TA98+S9	94.60	N.A.	N.A.	N.A.
	TA100	94.60	.06	4.77	1.0
	TA100+S9	94.60	-.87	5.13	1.0
17-Mar-1982					
	TA98	90.80	2.79	1.31	1.8
	TA98+S9	90.80	1.64	1.47	1.5
	TA100	90.80	7.46	6.35	1.3
	TA100+S9	90.80	4.84	4.36	1.1
23-Mar-1982					
	TA98	64.30	.74	2.62	1.3
	TA98+S9	64.30	.35	1.12	1.1
	TA100	64.30	7.00	6.88	1.2
	TA100+S9	64.30	9.49	9.71	1.4
24-Mar-1982					
	TA98	75.70	.29	1.77	1.1
	TA98+S9	75.70	.87	1.32	1.1
	TA100	75.70	11.26	5.63	1.4
	TA100+S9	75.70	8.05	5.12	1.3
30-Mar-1982					
	TA98	56.80	1.65	2.34	1.3
	TA98+S9	56.80	1.92	3.51	1.7
	TA100	56.80	2.35	11.53	1.2
	TA100+S9	56.80	7.87	11.08	1.3
31-Mar-1982					
	TA98	56.80	1.98	1.35	1.5
	TA98+S9	56.80	2.97	2.60	1.9
	TA100	56.80	4.97	7.17	1.2
	TA100+S9	56.80	4.13	8.82	1.4
6-Apr-1982					
	TA98	68.10	-.37	1.69	1.4
	TA98+S9	68.10	1.39	1.16	1.5
	TA100	68.10	-1.62	7.52	1.0
	TA100+S9	68.10	-.52	4.79	1.1
7-Apr-1982					
	TA98	75.70	6.54	2.59	3.3
	TA98+S9	75.70	3.80	1.87	1.8
	TA100	75.70	10.58	6.00	1.4
	TA100+S9	75.70	8.02	4.67	1.4
20-Apr-1982					
	TA98	113.60	13.72	1.84	6.7
	TA98+S9	113.60	6.57	1.68	3.3
	TA100	113.60	29.65	4.24	2.8
	TA100+S9	113.60	16.08	3.87	1.9
21-Apr-1982					
	TA98	113.60	8.11	1.25	4.4
	TA98+S9	113.60	3.52	2.19	2.3
	TA100	113.60	39.51	3.80	3.3
	TA100+S9	113.60	18.44	7.58	2.1
27-Apr-1982					
	TA98	106.00	.69	1.20	1.3
	TA98+S9	106.00	.31	1.36	1.2
	TA100	106.00	3.48	4.17	1.1
	TA100+S9	106.00	3.70	4.20	1.3
28-Apr-1982					
	TA98	98.40	7.13	1.50	3.4
	TA98+S9	98.40	3.11	1.79	1.7
	TA100	98.40	17.03	6.01	1.7
	TA100+S9	98.40	9.18	4.95	1.5
4-May-1982					
	TA98	113.60	-.07	.85	1.1
	TA98+S9	113.60	.94	1.16	1.2
	TA100	113.60	.13	3.15	1.1
	TA100+S9	113.60	2.82	4.16	1.3
5-May-1982					
	TA98	68.10	2.70	2.03	1.7
	TA98+S9	68.10	5.11	9.98	4.3
	TA100	68.10	23.56	6.49	1.9
	TA100+S9	68.10	13.07	7.87	1.5

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		WTP 3 Finished Water (continued)			
11-May-1982					
	TA98	87.10	3.91	1.61	2.8
	TA98+S9	87.10	2.45	1.99	1.9
	TA100	87.10	11.14	6.00	1.6
	TA100+S9	87.10	10.06	6.15	1.5
12-May-1982					
	TA98	90.80	1.36	.90	1.6
	TA98+S9	90.80	.97	1.56	1.2
	TA100	90.80	6.97	4.74	1.4
	TA100+S9	90.80	4.28	6.63	1.4
18-May-1982					
	TA98	56.80	8.05	2.20	3.1
	TA98+S9	56.80	3.72	2.35	1.6
	TA100	56.80	19.86	10.12	1.7
	TA100+S9	56.80	18.36	8.58	1.6
19-May-1982					
	TA98	34.10	2.88	1.15	1.9
	TA98+S9	34.10	1.82	2.87	1.4
	TA100	34.10	8.98	5.20	1.3
	TA100+S9	34.10	5.16	11.41	1.2
25-May-1982					
	TA98	106.00	2.25	1.29	2.1
	TA98+S9	106.00	.71	1.34	1.3
	TA100	106.00	2.15	3.19	1.1
	TA100+S9	106.00	1.11	3.50	1.2
26-May-1982					
	TA98	125.00	1.62	1.18	2.1
	TA98+S9	125.00	.44	1.01	1.2
	TA100	125.00	2.61	3.12	1.2
	TA100+S9	125.00	.70	4.22	1.3
2-Jun-1982					
	TA98	113.60	1.68	1.22	1.6
	TA98+S9	113.60	1.27	1.01	1.6
	TA100	113.60	4.81	4.23	1.2
	TA100+S9	113.60	2.33	3.49	1.1
15-Jun-1982					
	TA98	117.30	4.67	2.64	3.1
	TA98+S9	117.30	2.00	1.0	1.8
	TA100	117.30	4.37	2.28	1.3
	TA100+S9	117.30	2.76	2.33	1.1
16-Jun-1982					
	TA98	90.80	8.25	1.58	4.7
	TA98+S9	90.80	5.51	1.39	2.9
	TA100	90.80	17.02	2.25	1.8
	TA100+S9	90.80	4.10	2.32	1.2
22-Jun-1982					
	TA98	113.60	2.78	1.27	2.5
	TA98+S9	113.60	1.44	1.49	1.6
	TA100	113.60	7.31	2.91	1.4
	TA100+S9	113.60	5.34	2.93	1.3
23-Jun-1982					
	TA98	115.40	1.74	.70	1.9
	TA98+S9	115.40	1.16	1.31	1.3
	TA100	115.40	2.06	2.94	1.1
	TA100+S9	115.40	1.68	3.26	1.1
29-Jun-1982					
	TA98	53.00	1.51	2.07	1.5
	TA98+S9	53.00	1.34	2.24	1.3
	TA100	53.00	-4.96	7.49	.9
	TA100+S9	53.00	3.90	5.65	1.1
7-Jul-1982					
	TA98	98.40	1.46	1.17	1.4
	TA98+S9	98.40	.38	1.65	1.3
	TA100	98.40	1.74	3.80	1.3
	TA100+S9	98.40	1.22	3.02	1.1
13-Jul-1982					
	TA98	123.00	.67	.92	1.5
	TA98+S9	123.00	.53	.90	1.2
	TA100	123.00	-1.16	3.28	1.0
	TA100+S9	123.00	.62	2.29	1.1
14-Jul-1982					
	TA98	123.00	.34	1.01	1.3
	TA98+S9	123.00	N.A.	N.A.	N.A.
	TA100	123.00	1.92	4.24	1.2
	TA100+S9	123.00	N.A.	N.A.	N.A.

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
		WTP 3 Finished Water (continued)			
20-Jul-1982					
	TA98	53.00	1.12	2.35	1.2
	TA98+S9	53.00	N.A.	N.A.	N.A.
	TA100	53.00	1.28	10.12	1.0
	TA100+S9	53.00	N.A.	N.A.	N.A.
27-Jul-1982					
	TA98	60.60	-.01	1.77	1.0
	TA98+S9	60.60	.57	2.10	1.2
	TA100	60.60	-.55	7.07	1.2
	TA100+S9	60.60	-3.66	5.54	1.0
3-Aug-1982					
	TA98	106.00	.30	1.44	1.0
	TA98+S9	106.00	.75	.93	1.3
	TA100	106.00	3.13	4.15	1.1
	TA100+S9	106.00	-.88	4.20	1.2
11-Aug-1982					
	TA98	109.80	8.16	1.88	2.9
	TA98+S9	109.80	7.83	1.15	4.3
	TA100	109.80	23.02	4.38	2.3
	TA100+S9	109.80	10.19	2.22	1.7
18-Aug-1982					
	TA98	109.80	5.22	1.11	3.3
	TA98+S9	109.80	3.83	1.16	2.4
	TA100	109.80	8.54	3.81	1.5
	TA100+S9	109.80	5.20	3.50	1.3
14-Sep-1982					
	TA98	124.90	2.87	.89	2.8
	TA98+S9	124.90	1.81	.98	1.8
	TA100	124.90	11.47	2.56	1.7
	TA100+S9	124.90	5.01	3.48	1.3
21-Sep-1982					
	TA98	87.10	2.45	1.55	1.5
	TA98+S9	87.10	1.69	1.25	1.3
	TA100	87.10	8.29	4.13	1.4
	TA100+S9	87.10	4.91	3.77	1.3
22-Sep-1982					
	TA98	83.30	.53	1.42	1.2
	TA98+S9	83.30	1.18	2.67	1.2
	TA100	83.30	6.60	4.10	1.3
	TA100+S9	83.30	4.95	4.63	1.3
6-Oct-1982					
	TA98	132.50	3.56	.80	3.9
	TA98+S9	132.50	3.87	.65	2.9
	TA100	132.50	7.50	2.73	1.5
	TA100+S9	132.50	3.84	2.76	1.2
19-Oct-1982					
	TA98	90.80	2.79	1.08	2.6
	TA98+S9	90.80	.83	1.37	1.3
	TA100	90.80	10.08	4.68	1.5
	TA100+S9	90.80	6.56	3.74	1.2
2-Nov-1982					
	TA98	79.50	1.70	1.19	1.8
	TA98+S9	79.50	.01	2.04	1.3
	TA100	79.50	1.32	5.65	1.1
	TA100+S9	79.50	2.03	5.98	1.1
16-Nov-1982					
	TA98	98.40	2.37	1.47	1.8
	TA98+S9	98.40	N.A.	N.A.	N.A.
	TA100	98.40	11.34	6.78	1.6
	TA100+S9	98.40	N.A.	N.A.	N.A.
30-Nov-1982					
	TA98	90.80	6.39	1.20	3.6
	TA98+S9	90.80	2.97	1.86	2.2
	TA100	90.80	23.84	3.46	2.2
	TA100+S9	90.80	15.73	4.50	1.9
14-Dec-1982					
	TA98	77.60	-.26	1.21	.9
	TA98+S9	77.60	-.42	1.30	.9
	TA100	77.60	13.99	14.21	1.3
	TA100+S9	77.60	-7.41	42.39	1.2
21-Dec-1982					
	TA98	104.00	1.35	.63	2.0
	TA98+S9	104.00	.31	.94	1.1
	TA100	104.00	8.70	3.27	3.0
	TA100+S9	104.00	4.08	2.52	1.6
28-Dec-1982					
	TA98	94.60	3.27	1.12	2.2
	TA98+S9	94.60	.54	1.23	1.2
	TA100	94.60	13.82	2.75	1.5
	TA100+S9	94.60	4.48	4.91	1.2

TABLE H-20
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 18 FEBRUARY 1983
AMES TEST
(Continued)

Date	Strain	Volume Filtered in Liters	Specific Activity (Revertants Per Liter)	95 % [1] Confidence Interval	Mutagenic Ratio
WTP 3 Finished Water (continued)					
25-Jan-1983					
	TA98	49.20	4.64	2.87	2.3
	TA98+S9	49.20	3.23	3.52	1.7
	TA100	49.20	-7.50	10.69	1.1
	TA100+S9	49.20	7.72	18.45	1.5
7-Feb-1983					
	TA98	45.40	N.A.	N.A.	N.A.
	TA98+S9	45.40	N.A.	N.A.	N.A.
	TA100	45.40	N.A.	N.A.	N.A.
	TA100+S9	45.40	N.A.	N.A.	N.A.
15-Feb-1983					
	TA98	26.50	1.81	2.87	1.4
	TA98+S9	26.50	5.40	4.12	1.7
	TA100	26.50	N.A.	N.A.	N.A.
	TA100+S9	26.50	N.A.	N.A.	N.A.

1. Numbers refer to the size of the interval bracketing the corresponding specific activity value; i.e. Specific Activity ± Confidence Interval.

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

EEWTP Finished Water
(Phase IA)

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
15-Jul-1981	0.60	2/14	8.80	0.81	
	1.70	0/15	7.80	0.00	
	2.50	0/10	0.00	N.A.	
	2.50	5/10	N.A.	N.A.	Positive Control
9-Sep-1981	0.50	1/14	5.60	0.64	
	0.75	0/11	4.60	0.00	
	1.00	0/ 7	3.10	0.00	
	2.50	7/13	N.A.	N.A.	Positive Control
27-Oct-1981	0.20	0/11	3.50	0.00	
	0.30	0/11	11.00	0.00	
	0.50	0/12	6.50	0.00	
	5.00	10/11	7.00	6.49	Positive Control
19-Nov-1981	0.25	0/17	21.50	0.00	
	0.50	0/18	20.50	0.00	
	0.70	0/13	20.00	0.00	
	5.00	7/15	13.80	1.69	Positive Control
20-Jan-1982	0.25	0/15	22.50	0.00	
	0.50	0/11	21.10	0.00	
	0.70	0/13	18.80	0.00	
	5.00	7/15	13.80	1.69	Positive Control
9-Feb-1982	0.30	0/14	12.50	0.00	
	0.50	0/14	13.10	0.00	
	0.70	0/16	10.60	0.00	
	5.00	18/15	6.60	9.07	Positive Control
24-Feb-1982	0.40	0/11	16.00	0.00	
	0.50	0/ 7	13.50	0.00	
	0.60	0/11	12.50	0.00	
	5.00	11/17	12.30	2.62	Positive Control

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

EEWTP Finished Water
(Phase IM)

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
24-Mar-1982	0.25	0/13	12.00	0.00	
	0.50	0/ 8	8.80	0.00	
	0.90	0/16	1.70	0.00	
	6.00	20/17	5.00	11.74	Positive Contro
6-Apr-1982	0.40	0/14	8.90	0.00	
	0.75	0/11	8.80	0.00	
	1.00	0/17	10.50	0.00	
	7.50	16/15	6.70	7.94	Positive Contro
20-Apr-1982	0.40	0/ 8	5.80	0.00	
	0.75	0/11	4.50	0.00	
	1.00	0/10	4.30	0.00	
	8.00	24/14	7.30	11.72	Positive Contro
4-May-1982	0.50	0/20	15.20	0.00	
	0.75	0/14	14.70	0.00	
	1.00	0/20	12.30	0.00	
	7.50	44/19	N.A.	N.A.	Positive Contro
18-May-1982	0.50	0/16	12.90	0.00	
	0.75	0/12	12.10	0.00	
	1.00	0/14	10.60	0.00	
	6.50	19/14	11.70	5.79	Positive Contro
2-Jun-1982	0.50	0/16	6.00	0.00	
	0.75	0/18	6.50	0.00	
	1.00	0/17	8.40	0.00	
	7.50	24/20	12.60	4.75	Positive Contro
15-Jun-1982	0.40	0/20	3.60	0.00	
	0.75	0/19	0.40	0.00	
	1.00	0/20	0.10	0.00	
	7.50	16/20	8.20	4.87	Positive Contro
29-Jun-1982	0.40	0/20	18.80	0.00	
	0.75	0/17	13.40	0.00	
	1.00	0/20	14.90	0.00	
	6.70	21/20	20.10	2.61	Positive Contro

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

EEWTP Finished Water
(Phase IIA)

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
28-Jul-1982	0.40	0/13	13.50	0.00	
	0.75	0/20	15.00	0.00	
	1.00	0/20	16.20	0.00	
	5.00	13/20	17.80	1.82	Positive Control
11-Aug-1982	0.50	0/18	7.70	0.00	
	0.75	0/15	9.00	0.00	
	1.00	0/18	7.00	0.00	
	8.30	4/15	16.10	0.82	Positive Control
1-Sep-1982	0.20	0/20	13.80	0.00	
	0.50	0/18	11.30	0.00	
	1.00	0/15	6.20	0.00	
	8.30	35/25	16.90	4.13	Positive Control
21-Sep-1982	0.40	N.A.	3.30	N.A.	
	0.75	N.A.	0.40	N.A.	
	1.00	N.A.	1.80	N.A.	
	8.30	N.A.	2.00	N.A.	Positive Control
19-Oct-1982	0.40	0/15	19.90	0.00	
	0.75	0/16	17.30	0.00	
	1.00	0/ 9	13.60	0.00	
	8.30	9/14	7.50	4.28	Positive Control
16-Nov-1982	0.50	0/19	20.90	0.00	
	0.75	0/10	20.50	0.00	
	1.00	0/14	19.80	0.00	
	8.30	8/ 5	19.50	4.09	Positive Control
30-Nov-1982	0.70	0/19	10.30	0.00	
	1.00	0/15	5.10	0.00	
	12.50	12/17	7.20	4.89	Positive Control
14-Dec-1982	0.25	0/19	9.50	0.00	
	0.40	0/20	5.80	0.00	
	0.80	0/17	2.00	0.00	
	7.50	14/18	8.80	4.41	Positive Control
29-Dec-1982	0.50	0/20	3.50	0.00	
	1.00	0/20	1.00	0.00	
	10.00	12/15	5.70	7.00	Positive Control

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

Water Treatment Plant 1 Finished Water

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
1-Jul-1981	0.60	1/14	10.90	0.33	
	1.20	0/10	8.70	0.00	
	2.30	1/ 6	6.30	1.32	
	2.50	5/10	N.A.	N.A.	Positive Control
30-Jul-1981	0.40	0/ 3	6.90	0.00	
	0.90	0/ 6	2.60	0.00	
	1.80	N.A.	0.07	N.A.	
	2.50	10/10	N.A.	N.A.	Positive Control
4-Sep-1981	0.25	0/14	N.A.	N.A.	
	0.50	0/ 9	N.A.	N.A.	
	0.75	0/ 7	N.A.	N.A.	
	2.50	7/13	N.A.	N.A.	Positive Control
27-Oct-1981	0.20	0/11	12.20	0.00	
	0.30	0/ 6	12.80	0.00	
	0.50	0/13	7.80	0.00	
	5.00	10/11	7.00	6.48	Positive Control
10-Feb-1982	0.30	0/17	10.10	0.00	
	0.50	0/14	13.90	0.00	
	0.70	0/14	10.90	0.00	
	5.00	18/15	6.60	9.07	Positive Control
24-Feb-1982	0.40	0/11	13.50	0.00	
	0.50	0/11	12.00	0.00	
	0.60	0/13	11.40	0.00	
	5.00	11/17	12.30	2.62	Positive Control
24-Mar-1982	0.25	0/15	10.90	0.00	
	0.50	0/14	6.70	0.00	
	0.90	0/14	3.70	0.00	
	6.00	20/17	5.00	11.74	Positive Control
6-Apr-1982	0.40	0/ 8	9.60	0.00	
	0.75	0/15	5.30	0.00	
	1.00	0/ 8	6.00	0.00	
	7.50	16/15	6.70	7.94	Positive Control
20-Apr-1982	0.40	0/13	8.50	0.00	
	0.75	0/14	8.50	0.00	
	1.00	0/15	4.20	0.00	
	8.00	24/14	7.30	11.72	Positive Control
4-May-1982	0.50	0/20	19.20	0.00	
	0.75	0/19	17.60	0.00	
	1.00	0/15	16.00	0.00	
	7.50	44/19	N.A.	N.A.	Positive Control

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

Water Treatment Plant 1 Finished Water
(continued)

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
18-May-1982	0.50	0/13	9.10	0.00	
	0.75	0/10	7.50	0.00	
	1.00	0/16	9.20	0.00	
	6.50	19/14	11.70	5.79	Positive Control
2-Jun-1982	0.50	0/17	6.30	0.00	
	0.75	0/18	6.20	0.00	
	1.00	0/17	1.80	0.00	
	7.50	24/20	12.60	4.75	Positive Control
15-Jun-1982	0.40	0/20	8.50	0.00	
	0.75	0/19	8.80	0.00	
	1.00	0/18	9.00	0.00	
	7.50	16/20	8.20	4.87	Positive Control
29-Jun-1982	0.40	0/20	17.90	0.00	
	0.75	0/20	18.00	0.00	
	1.00	0/20	11.40	0.00	
	6.70	21/20	20.10	2.61	Positive Control
27-Jul-1982	0.40	0/15	11.00	0.00	
	0.75	0/ 7	5.00	0.00	
	1.00	0/19	0.30	0.00	
	5.00	13/20	17.80	1.82	Positive Control
11-Aug-1982	0.50	0/19	8.70	0.00	
	0.75	0/15	6.00	0.00	
	1.00	0/17	3.00	0.00	
	8.30	4/15	16.10	0.82	Positive Control
1-Sep-1982	0.50	0/ 5	7.90	0.00	
	1.00	0/ 6	4.80	0.00	
	8.30	35/25	16.90	4.13	Positive Control
21-Sep-1982	0.40	N.A.	11.30	N.A.	
	0.75	N.A.	5.70	N.A.	
	1.00	N.A.	6.40	N.A.	
	8.30	N.A.	8.00	N.A.	Positive Control
19-Oct-1982	0.40	0/17	16.20	0.00	
	0.75	0/17	6.80	0.00	
	1.00	1/15	2.90	1.14	
	8.30	9/14	7.50	4.28	Positive Control
16-Nov-1982	0.50	0/19	17.80	0.00	
	0.75	0/13	23.60	0.00	
	1.00	0/16	22.70	0.00	
	8.30	8/ 5	19.50	4.09	Positive Control

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

Water Treatment Plant 1 Finished Water
(continued)

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
30-Nov-1982	0.40	0/12	10.30	0.00	
	0.70	0/ 8	8.60	0.00	
	1.00	0/ 5	8.60	0.00	
	12.50	17/17	7.20	4.89	Positive Control
14-Dec-1982	0.25	0/16	9.40	0.00	
	0.40	0/19	8.80	0.00	
	0.80	0/18	7.90	0.00	
	7.50	14/18	8.80	4.41	Positive Control
28-Dec-1982	0.25	0/17	6.70	0.00	
	0.50	0/19	9.50	0.00	
	1.00	0/20	7.40	0.00	
	10.00	12/15	5.70	7.00	Positive Control

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

Water Treatment Plant 2 Finished Water

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
3-Jul-1981	0.60	0/ 9	5.00	0.00	
	1.20	1/13	1.00	3.84	
	2.30	0/10	0.02	0.00	
	2.50	5/10	N.A.	N.A.	Positive Control
30-Jul-1981	0.40	4/14	N.A.	N.A.	
	0.80	0/12	N.A.	N.A.	
	1.70	0/11	N.A.	N.A.	
	2.50	10/10	N.A.	N.A.	Positive Control
28-Aug-1981	0.40	2/ 4	N.A.	N.A.	
	0.90	1/ 6	N.A.	N.A.	
	1.80	0/ 5	N.A.	N.A.	
	2.50	10/10	N.A.	N.A.	Positive Control
4-Sep-1981	0.25	0/15	N.A.	N.A.	
	0.50	0/ 8	N.A.	N.A.	
	0.75	N.A.	N.A.	N.A.	
	2.50	7/13	N.A.	N.A.	Positive Control
27-Oct-1981	0.20	0/13	6.70	0.00	
	0.30	0/10	7.00	0.00	
	0.50	0/17	1.80	0.00	
	5.00	10/11	7.00	6.48	Positive Control
20-Jan-1982	0.25	0/18	21.50	0.00	
	0.50	0/19	19.50	0.00	
	0.70	0/18	14.30	0.00	
	5.00	7/15	13.80	1.69	Positive Control
9-Feb-1982	0.30	0/16	13.10	0.00	
	0.50	0/13	8.20	0.00	
	0.70	0/ 9	14.60	0.00	
	5.00	18/15	6.60	9.07	Positive Control
24-Feb-1982	0.40	0/12	16.50	0.00	
	0.50	0/18	18.00	0.00	
	0.60	0/19	15.00	0.00	
	5.00	11/17	12.30	2.62	Positive Control
24-Mar-1982	0.25	0/11	13.10	0.00	
	0.50	0/16	9.40	0.00	
	0.90	0/14	4.80	0.00	
	6.00	20/17	5.00	11.74	Positive Control
6-Apr-1982	0.40	0/17	15.30	0.00	
	0.75	0/11	16.40	0.00	
	1.00	0/11	11.70	0.00	
	7.50	16/15	6.70	7.94	Positive Control

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

Water Treatment Plant 2 Finished Water
(continued)

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
20-Apr-1982	0.40	0/12	3.20	0.00	
	0.75	0/17	4.40	0.00	
	1.00	0/12	4.90	0.00	
	8.00	24/14	7.30	11.72	Positive Control
4-May-1982	0.50	0/19	17.50	0.00	
	0.75	0/18	18.30	0.00	
	1.00	0/19	15.90	0.00	
	7.50	44/19	N.A.	N.A.	Positive Control
19-May-1982	0.50	0/ 7	17.50	0.00	
	0.75	0/11	13.50	0.00	
	1.00	0/ 5	13.20	0.00	
	6.50	19/14	11.70	5.79	Positive Control
9-Jun-1982	0.50	0/17	16.00	0.00	
	0.75	0/19	13.80	0.00	
	1.00	0/19	11.50	0.00	
	7.50	24/20	12.60	4.75	Positive Control
15-Jun-1982	0.40	0/16	8.60	0.00	
	0.75	0/19	6.90	0.00	
	1.00	0/20	3.80	0.00	
	7.50	16/20	8.20	4.87	Positive Control
29-Jun-1982	0.40	0/20	22.40	0.00	
	0.75	0/19	17.50	0.00	
	1.00	0/19	14.60	0.00	
	6.70	21/20	20.10	2.61	Positive Control
27-Jul-1982	0.40	0/19	15.60	0.00	
	0.75	0/20	16.40	0.00	
	1.00	0/20	15.30	0.00	
	5.00	13/20	17.80	1.82	Positive Control
11-Aug-1982	0.50	0/17	8.90	0.00	
	0.75	0/18	7.10	0.00	
	1.00	0/12	5.00	0.00	
	8.30	4/15	16.10	0.82	Positive Control
1-Sep-1982	0.20	0/20	13.40	0.00	
	0.50	0/ 9	16.80	0.00	
	8.30	35/25	16.90	4.13	Positive Control
21-Sep-1982	0.40	N.A.	8.80	N.A.	
	0.75	N.A.	3.50	N.A.	
	1.00	N.A.	2.60	N.A.	
	8.30	N.A.	8.00	N.A.	Positive Control

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

Water Treatment Plant 2 Finished Water
(continued)

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
19-Oct-1982	0.40	0/19	8.60	0.00	
	0.75	0/13	5.60	0.00	
	1.00	0/18	0.60	0.00	
	8.30	9/14	7.50	4.28	Positive Control
16-Nov-1982	0.50	0/ 5	24.70	0.00	
	0.75	0/13	24.80	0.00	
	8.30	8/ 5	19.50	4.09	Positive Control
30-Nov-1982	0.40	0/15	6.90	0.00	
	0.70	0/ 6	5.00	0.00	
	1.00	0/ 9	3.40	0.00	
	12.50	12/17	7.20	4.89	Positive Control
14-Dec-1982	0.25	0/18	4.50	0.00	
	0.40	0/17	2.20	0.00	
	0.80	0/18	0.20	0.00	
	7.50	14/18	8.80	4.41	Positive Control
28-Dec-1982	0.25	0/20	6.80	0.00	
	0.50	0/20	6.00	0.00	
	1.00	0/20	7.90	0.00	
	10.00	12/15	5.70	7.00	Positive Control

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

Water Treatment Plant 3 Finished Water

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
1-Jul-1981	0.50	0/13	6.20	0.00	
	1.10	0/ 8	5.50	0.00	
	2.20	0/ 9	0.08	0.00	
	2.50	5/10	N.A.	N.A.	Positive Control
30-Jul-1981	0.40	3/ 8	N.A.	N.A.	
	0.80	1/ 5	N.A.	N.A.	
	1.60	0/13	N.A.	N.A.	
	2.50	10/10	N.A.	N.A.	Positive Control
4-Sep-1981	0.25	0/13	N.A.	N.A.	
	0.50	0/ 8	N.A.	N.A.	
	0.75	0/ 9	N.A.	N.A.	
	2.50	7/13	N.A.	N.A.	Positive Control
27-Oct-1981	0.20	0/10	6.80	0.00	
	0.30	0/14	2.60	0.00	
	0.50	0/15	0.00	N.A.	
	5.00	10/11	7.00	6.48	Positive Control
20-Jan-1982	0.25	0/11	15.70	0.00	
	0.50	0/17	18.00	0.00	
	0.70	0/15	17.50	0.00	
	5.00	7/15	13.80	1.69	Positive Control
9-Feb-1982	0.30	0/ 9	13.60	0.00	
	0.50	0/14	9.70	0.00	
	0.70	0/17	11.40	0.00	
	5.00	18/15	6.60	9.07	Positive Control
24-Feb-1982	0.40	0/20	14.50	0.00	
	0.50	0/16	15.00	0.00	
	0.60	0/14	15.00	0.00	
	5.00	11/17	12.30	2.62	Positive Control
24-Mar-1982	0.25	0/17	14.90	0.00	
	0.50	0/16	9.20	0.00	
	0.90	0/15	3.80	0.00	
	6.00	20/17	5.00	11.79	Positive Control
6-Apr-1982	0.40	0/10	8.80	0.00	
	0.75	0/13	11.20	0.00	
	1.00	1/12	5.10	0.81	
	7.50	16/15	6.70	7.94	Positive Control
21-Apr-1982	0.40	0/ 9	9.80	0.00	
	0.75	0/17	4.60	0.00	
	1.00	0/11	7.40	0.00	
	8.00	24/14	7.30	11.72	Positive Control

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

Water Treatment Plant 3 Finished Water
(continued)

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
4-May-1982	0.50	0/18	12.10	0.00	
	0.75	0/16	13.00	0.00	
	1.00	0/19	16.20	0.00	
	7.50	44/19	N.A.	N.A.	Positive Control
18-May-1982	0.50	0/ 4	12.60	0.00	
	0.75	0/ 5	9.60	0.00	
	1.00	0/18	4.50	0.00	
	6.50	19/14	12.70	5.79	Positive Control
9-Jun-1982	0.50	0/18	8.60	0.00	
	0.75	0/17	8.00	0.00	
	1.00	0/17	10.80	0.00	
	7.50	24/20	12.60	4.75	Positive Control
15-Jun-1982	0.40	0/20	12.20	0.00	
	0.75	0/20	7.20	0.00	
	1.00	0/19	5.60	0.00	
	7.50	16/20	8.20	4.87	Positive Control
29-Jun-1982	0.40	0/20	12.30	0.00	
	0.75	0/17	6.80	0.00	
	1.00	0/20	3.50	0.00	
	6.70	21/20	20.10	2.61	Positive Control
27-Jul-1982	0.40	0/20	9.40	0.00	
	0.75	0/16	6.60	0.00	
	1.00	0/20	1.50	0.00	
	5.00	13/20	17.80	1.82	Positive Control
11-Aug-1982	0.50	0/ 8	14.70	0.00	
	0.75	0/11	13.00	0.00	
	1.00	0/16	9.40	0.00	
	8.30	4/15	16.10	0.83	Positive Control
1-Sep-1982	0.50	0/19	19.50	0.00	
	1.00	0/20	14.30	0.00	
	8.30	35/25	16.90	4.14	Positive Control
21-Sep-1982	0.40	N.A.	11.90	N.A.	
	0.75	N.A.	11.60	N.A.	
	1.00	N.A.	5.00	N.A.	
	8.30	N.A.	8.00	N.A.	Positive Control
19-Oct-1982	0.40	0/15	5.20	0.00	
	0.75	0/18	0.00	N.A.	
	1.00	0/12	0.00	N.A.	
	8.30	9/14	7.50	4.28	Positive Control

TABLE H-21
CHARACTERIZATION OF FINISHED WATERS
16 MARCH 1981 TO 16 MARCH 1983
MAMMALIAN CELL TRANSFORMATION

Water Treatment Plant 3 Finished Water
(continued)

Sampling Date	Dose (Equiv. Liters per Plate)	Total of Type II and Type III Foci /Plates Examined	Plating Efficiency[a] (Percent)	Transformation Frequency (Foci/1000 Surviving Cells)	
16-Nov-1982	0.75	0/ 5	23.80	0.00	
	1.00	0/ 5	23.50	0.00	
	8.30	8/ 5	19.50	4.09	Positive Control
30-Nov-1982	0.40	0/ 2	6.90	0.00	
	0.70	0/ 6	1.40	0.00	
	17.50	17/17	7.20	4.89	Positive Control
14-Dec-1982	0.25	0/20	11.90	0.00	
	0.40	0/17	11.20	0.00	
	0.80	0/18	4.20	0.00	
	7.50	14/18	8.80	4.41	Positive Control
28-Dec-1982	0.25	0/20	2.80	0.00	
	0.50	0/20	4.30	0.00	
	1.00	0/20	0.00	N.A.	
	10.00	12/15	5.70	7.00	Positive Control

a. Each plate has 2,000 cells. Therefore, number of Surviving cells is 2000*(Plating Efficiency).

APPENDIX I

SPECIAL STUDIES AND INVESTIGATIONS

In addition to routine monitoring and evaluation of the plant performance, a number of special studies were conducted to further characterize and optimize the plant processes, as well as to investigate other potential processes not examined at the demonstration plant level. These studies were part of a Testing Program for Process Adjustment and Modifications (TPPAM) conducted during the course of the project.

The studies conducted for the TPPAM can be divided into either a) an EEWTP process characterization and optimization study or b) an investigation of an alternative process design. Using these two categories, a tabular summary of the studies discussed in Appendix I are defined below.

CHARACTERIZE AND OPTIMIZE A PROCESS

Section 1 Coagulation
Section 2 Filtration
Section 6 GAC Special Study
Section 7 Manganese Removal
Section 8 THM/TOX Formation
Section 9 Corrosion
Section 10 Hydraulic Characterization

INVESTIGATION OF ALTERNATIVE PROCESS DESIGN

Section 3 Granular Activated Carbon Adsorption
Section 4 Packed Tower Aeration
Section 5 Reverse Osmosis

SECTION 1

COAGULATION STUDY

BACKGROUND

INTRODUCTION

Historically, destabilization of influent particulate matter in the form of turbidity has been recognized as the primary purpose of the coagulation process. Recently, attention has been focused on the control of trihalomethanes, suspected cancer causing compounds. Humic substances, measured in terms of total organic carbon (TOC), are prevalent in the EEWTP influent and are precursors to the formation of trihalomethanes and other chlorinated organics during chlorination. These substances can be removed during coagulation; however, operating conditions must be selected which are also effective in the removal of turbidity. Therefore, optimization of coagulation chemistry in the full-scale plant was evaluated with respect to the removal of TOC and turbidity.

By optimizing the coagulation process, maximum removals of turbidity, TOC, metals, bacteria and asbestos can be achieved for minimum coagulant costs. In addition, increased removal of humic material during coagulation will result in a more effective utilization of the granular activated carbon and reduced formation of disinfection by-products, such as chlorinated organics. Finally, cost of the chemicals for coagulation can be decreased by selection of appropriate conditions for coagulation, including pH, coagulant type, coagulant combination, and dose.

OBJECTIVE

The major objective for all phases of the coagulation bench-scale testing was to determine alternative chemical combinations for optimum TOC removal while maintaining good turbidity removal, minimizing chemical costs and decreasing the volume of chemical sludge produced.

APPROACH

EXPERIMENTAL PLAN

Bench-scale jar tests were conducted in the different phases of the Coagulation Study, with each phase designed to answer specific questions or concerns related to achieving the primary objective above. Seven phases of testing were completed over the course of the project, as listed below. The different phases of the study are described under Discussion of Results in this section.

Alum Coagulation
1. Prescreening alum ($Al_2(SO_4)_3 \cdot 14H_2O$) and polymers
2. Evaluation of alum plus a selected coagulant aid
3. Coagulant/filter aid selection
4. Alum coagulation of influent streams
5. Evaluation of dissolved organic carbon (DOC) removal - alum and polymers as primary coagulants

Lime Coagulation
1. Lime as the sole coagulant
   a. Lime Without a Coagulant Aid
   b. Lime Plus Soda Ash (Na_2CO_3) For Hardness Control
2. Lime plus coagulant aids
   a. Polymers
   b. Ferric Chloride ($FeCl_3$)

METHODS

The general jar test procedure used during each phase of the coagulation study consisted of the following steps: 1) rapid mix a selected coagulant dosage with a 1L blend tank sample at 100 rpm for one minute using a Phipps and Byrd six-paddle jar test apparatus, 2) flocculate the mixture at 30 rpm for thirty minutes, and 3) settle the flocculated sample for twenty minutes. A detailed experimental protocol with modifications is described in Table I.1-1.

Turbidity, TOC and/or dissolved organic carbon (DOC), and pH measurements were performed on the blend tank water and on unfiltered and filtered supernatant samples using a Hach turbidimeter, a Dohrman DC-80 TOC analyzer and an Orion 501 ionanalyzer, respectively. Samples for TOC measurement were collected in 60 ml air-tight bottles, acidified with NH_2SO_4 to pH=2, biological activity was controlled with $NaSO_3$, and refrigerated at 4°C until analyzed.

DISCUSSION OF RESULTS

ALUM/POLYMER

Prescreening Alum and Polymers

Prior to the alum and polymer prescreening tests, polymers were reviewed and selected for coagulation. Polymers from half a dozen manufacturers were considered. Each polymer was defined by eight categories: charge, structure, molecular weight, charge density, EPA recommended maximum concentration, designed use, form and cost ($/pound). Polymer representatives were contacted and samples of recommended polymers were received for experimental use. Twenty-one polymers out of the initial list of recommended polymers were considered and are summarized in Table I.1-2.

TABLE I.1-1

COAGULATION STUDIES - EXPERIMENTAL PROTOCOL

1. Clean three 5 gallon carboys and rinse with Milli-Q.

2. Collect experimental water at the blend tank weir, rinsing each carboy with blend tank water first. Store collected water in 4°C refrigerator, if necessary. Allow water to achieve room temperature prior to testing.

3. Determine the chemical addition, 1N HCl or 1M NaOH, required to alter or control pH during experimentation. (Alum Phases 2 and 5)

4. Collect samples for analyses and/or measure the necessary influent parameters.
   a. Turbidity, NTU
   b. TOC, mg/L-C
   c. DOC, mg/L-C (Alum Phase 5, filtered sample water)
   d. UV Absorbance at 254 nm (Alum Phases 1, 2 and 3)
   e. pH
   f. Temperature, °C

5. Pour 1L of sample water into each 1L beaker and place on the jar tester.

6. Rapid mix
   a. Turn jar tester on so the paddles are moving slowly.
   b. Add coagulant and pH control chemical (Alum Phases 2 and 5) simultaneously to each 1L beaker, using one and/or two 25 ml beakers for the additions.
   c. Rapid mix at 100 rpm for one minute.
   d. Add the coagulant aid or second coagulant, if necessary, to each 1L beaker using 25 ml beakers for the addition.
   e. Rapid mix at 100 rpm for a second minute.

7. Flocculate at 30 rpm for thirty minutes.

8. Settle for twenty minutes.

9. Collect samples for analyses and/or measure the following:
   a. Turbidity, NTU
   b. TOC, mg/L-C (Alum Phase 3 and Lime Phases 1 and 2)
   c. UV Absorbance at 254 nm (Alum Phases 1, 2 and 3)

10. Filter 200 ml of settled supernatant through a glass fiber filter which has been prepared with 100 ml of Milli-Q.

11. Collect samples of and/or analyze filtrate for the parameters listed below.
   a. Turbidity, NTU
   b. DOC mg/L-C
   c. UV Absorbance at 254 nm (Alum Phases 1, 2 and 3)

12. Measure the pH and temperature, °C, of the remaining settled supernatant.

13. TOC and DOC samples are to be stored at 4°C until analyzed; they have been acidified with H_2SO_4.

TABLE I.1-2

POLYMER SUMMARY

Brand Name	Charge	Structure	Molecular Weight	Charge Density	EPA Max. Recommended Dose ppm	Form	Cost $/lb.	Designed Usage
Betz 1190	+	poly-quaternary amine	Low	High	10	Liquid	500 lb/drum 0– 1500 lbs 1.20	primary coagulant removal of colloidal turbidity
Betz 1160P	+	copolymer of acrylamide & quaternized cat. monomer	High	Low	1	Dry	50 lb. bag 0– 1500 lbs 3.68	coagulant aid liquid/ solid separation
Cat Floc	+	dim-dac	Low	High	7	Liquid	0.71	primary coagulant
Cat Floc T	+	dim-dac	Low	High	5	Liquid	0.60	primary coagulant performs better in lower turbidity H_2O
L-650E	0	emulsion (polymer in mineral oil)	High	—	1	Liquid	1.03	turbidity and color removal, most effective when used w/organic coag
L-675	-	emulsion	High	Low	1	Liquid	1.03	primary coag or as an aid in conjunction w/ an inorganic coag.
Coagulant Aid 243	-	Poly acrylamide	High	Low	1	Dry	3.54	coagulant aid improves thickening & settling
Coagulant Aid 253	-	Poly acrylamide	High	Moder.	1	Dry	3.54	coagulant aid improves thickening & settling

High Molecular Weight defines a polymer with a molecular weight $\geq 1x10^6$
Low Molecular Weight defines a polymer with a molecular weight $\leq 1x10^5$
dim-dac = homopolymer of diallyl dimethyl ammonium chloride

TABLE I.1-2 (Continued)

POLYMER SUMMARY

Brand Name	Charge	Structure	Molecular Weight	Charge Density	EPA Max. Recommended Dose ppm	Form	Cost $/lb.	Designed Usage
Coagulant Aid 233	0	poly acrylamide	High	—	1	Dry	3.54	coagulant aid & filtration aid
Separan NP10P	-	poly acrylamide	High	Low	1	Dry	50 lb bags 200# min. 2.75	primary .1- 1 ppm secondary .01- .1 ppm Filtration aid .001- .01 ppm
Polly-Treat NP10P	-	acrylamide	High	Low	1	Dry	50 lbs 2.90 100 lbs 2.65 500 lbs 2.35 1000 lbs 2.15	primary .25- 1 ppm secondary .1- 1 ppm filtration aid .002- .01 ppm
Magnifloc 572C	+	poly quaternary amines	Low	High	20	Liquid	500 lbs/drum 1 drum .91 2- 9 drums .86	primary coagulant for low turb. high color, enhances settling & filtration
Magnifloc 573C	+	poly quaternary amines	Low	High	20	Liquid	500 lbs/drum 1 drum .90 2- 9 drums .85	primary coagulant to replace inorganic salts filtration aid
Magnifloc 587C	+	poly quaternary amines	Medium	High	50	Liquid	450 lbs/drum 1 drum .67 2- 9 drums .62	primary coagulant filtration aid
Hercofloc 815	+	acrylamide based	High	Moder.	1	Dry	50 lb. bags 50# 2.75 1000# 2.45 2000# 2.25	primary coagulant (best to use with alum)

High Molecular Weight defines a polymer with a molecular weight $\geq 1 \times 10^6$
Low Molecular Weight defines a polymer with a molecular weight $\leq 1 \times 10^5$

TABLE I.1-2 (Continued)

POLYMER SUMMARY

Brand Name	Charge	Structure	Molecular Weight	Charge Density	EPA Max. Recommended Dose ppm	Form	Cost $/lb.	Designed Usage
Hercofloc 812	+	acrylamide based	High	Low	1	Dry	50 lb bags 50# 2.70 1000# 2.45 2000# 2.20	primary coagulant (best to use with alum)
Hercofloc 818	-	poly acrylamide	High	Low	1	Dry	50 lb bags 50# 2.55 1000# 2.39 2000# 2.05	coagulant aid 1018 designed to replace 818
Hercofloc 1018	-	sodium acoylate	High	Low	1	Dry	50 lb bag 50# 2.70 1000# 2.45 2000# 2.20	coagulant aid
Hercofloc 1021	-	sodium acoylate	High	High	1	Dry	50 lb bags 50# 2.70 1000# 2.45 2000# 2.20	coagulant aid
Magnifloc 834A	-		High	Low		Liquid		coagulant aid enhances solids settling
Chitosan		linear polymer of chitobiose, from crab shells				Dry		coagulant aid

High Molecular Weight defines a polymer with a molecular weight $\geq 1 \times 10^6$
Low Molecular Weight defines a polymer with a molecular weight $\leq 1 \times 10^5$

From the list of twenty-one polymers, the following nine polymers were chosen for the testing program.

Betz 1160P	Separan NP10P	Hercofloc 1021
Cat Floc T	Hercofloc 815	Magnifloc 834A
Magnifloc 572C	Hercofloc 1018	Chitosan

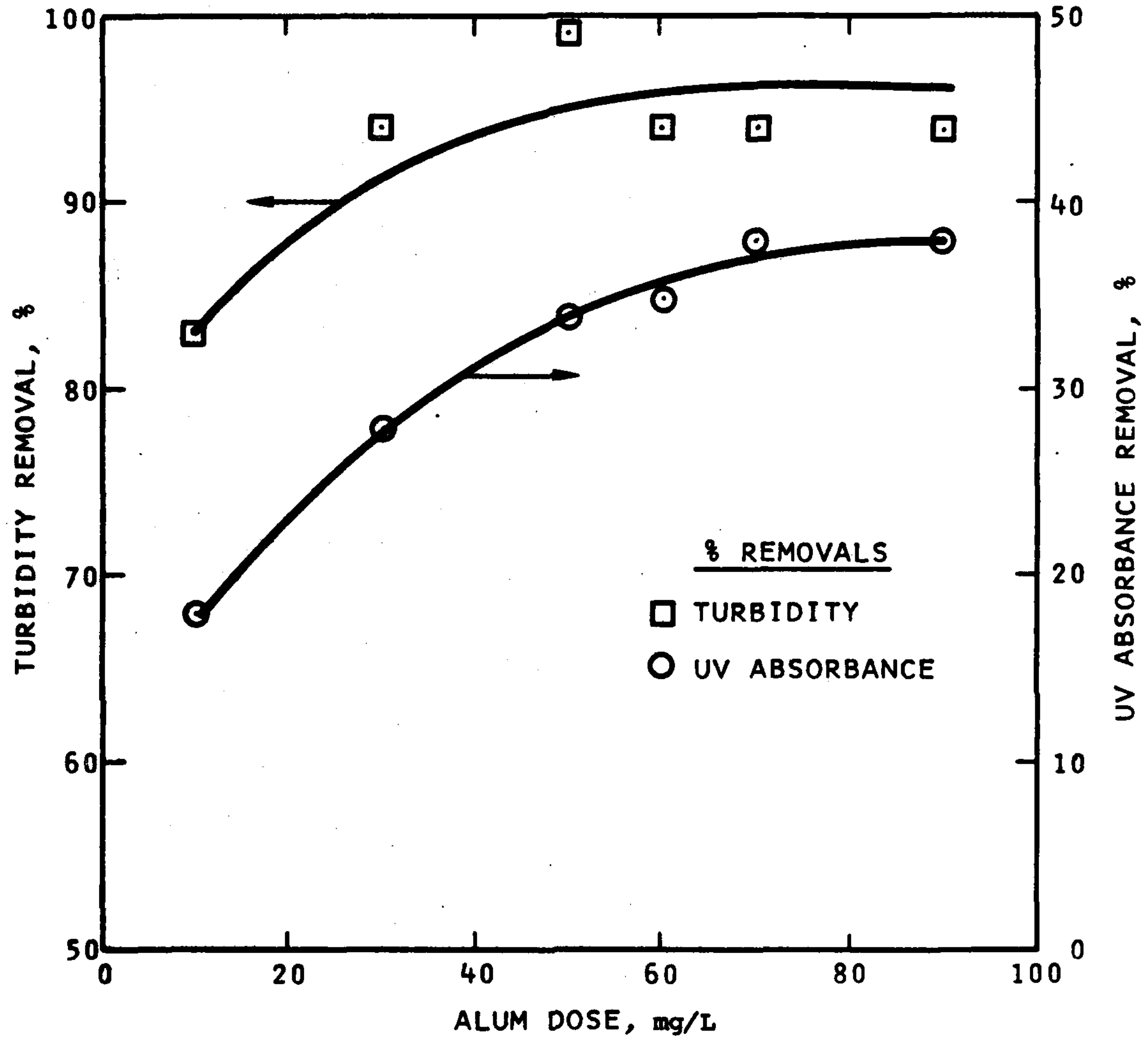
Charge, molecular weight, and charge density are the three characteristics which were considered during the initial selection process. Cationic polymers are noted for their effective use as coagulant and filtration aids in the field of water treatment. Anionic and nonionic polymers are generally used as coagulant and filtration aids, respectively. The list of nine polymers does not include nonionics because prior experience suggested they are poor coagulant aids, with respect to TOC removal.

Discussion. Ten jar tests were conducted, including a control test with alum alone and nine tests with alum and one of the selected polymers in combination.

Alum dosages of 10, 30, 50, 60, 70 and 90 mg/L were applied in the control test and turbidity and UV absorbance were used to evaluate performance. Optimum alum dose in terms of turbidity removal was 50 mg/L (99 percent removal) and in terms of UV absorbance was 70 mg/L (38 percent reduction), see Figure I.1-1. To determine the effect of the polymers on coagulation, as measured by final turbidity and UV absorbance, a non-optimum alum dose of 10 mg/L was chosen and used in combination with polymers at doses ranging from .02 to 10 mg/L.

The results from the nine alum/polymer combination jar tests indicate that the cationic polymers are better coagulant aids than the anionic polymers. Alum, when used as the sole coagulant at 10 mg/L, provided an 84 percent turbidity removal and an eighteen percent reduction in UV absorbance. Turbidity removal was improved with almost all of the alum/optimum polymer dose combinations. The reduction of UV absorbance, however, generally increased with the cationic polymers and decreased with the anionic polymers. Therefore, the results from the prescreening tests at the alum/optimum polymer doses divide the polymers into three classifications, defined below.

Class I. Significant turbidity removal and reduction in UV absorbance were achieved using polymer doses below the EPA recommended maximum concentration.



JAR TEST RESULTS-ALUM AS SOLE COAGULANT
FIGURE I. 1-1

Polymer	EPA Rating (mg/L)	Optimum Polymer Dose (mg/L)	% Turbidity Removal	% UV Abs. Reduction
Betz 1160P	1	0.1	88	23
Magnifloc 572C	20	10.0	92	20
Chitosan	n/a	0.5	93	19

Class II. A significant turbidity removal was achieved but UV absorbance reductions, comparable to those in Class I, were only obtained when polymer doses equivalent to the EPA recommended maximum concentration were used.

Polymer	EPA Rating (mg/L)	Optimum Polymer Dose (mg/L)	% Turbidity Removal	% UV Abs. Reduction
Cat Floc T	5	5	90	16
Hercofloc 815	1	1	90	20

Class III. Additional turbidity removal was obtained when the polymers were used in combination with the alum. Reductions in UV absorbance, however, were less than those achieved when 10 mg/L alum was used as the sole coagulant.

Polymer	EPA Rating (mg/L)	Polymer Dose (mg/L)	% Turbidity Removal	% UV Abs. Reduction
Hercofloc 1018	1	1	83	12
Hercofloc 1021	1	0.02	91	16
Separan NP10P	1	0.02	87	13
Magnifloc 834A	n/a	1	89	13

Conclusion. The selection of a polymer for Phase 2 testing was based on UV reduction and turbidity removals achieved by the alum/polymer combinations in Phase 1. The polymers with most promise were those previously categorized as Class I. The turbidity removals achieved by each alum/polymer combination in Class I show the most promise, representing significant improvements over the removals achieved when 10 mg/L alum was used as the sole coagulant. Reduction of UV absorbance indicates more significant variability between alum/polymer combinations and was, therefore, used as the decision variable.

On the basis of UV absorbance, the prescreening tests suggest that Betz 1160P is the best of the three coagulant aids in Class I. This polymer not only improved turbidity removal, but helped produce the optimum UV absorbance reduction. Therefore, Betz 1160P was selected for use in Phase 2.

Evaluation of Alum Plus a Selected Coagulant Aid

Ten jar tests were performed in Phase 2, one with alum alone and nine with alum/Betz 1160P combinations at three pH values. From the control test with alum as the sole coagulant, alum doses of 15, 30 and 50 mg/L were selected for the alum/Betz 1160P experiments. Each alum concentration was tested with Betz 1160P doses varying from .02 to 1.0 mg/L at pH values of 6.5, 7.0 and 7.5. The three pH values were selected based on the following considerations.

1. The water being treated has the potential for being aggressive or corrosive. When the pH drops below 6.5, the water's buffering capacity significantly decreases, increasing the corrosive potential.

2. When the pH is below 8, humic substances dissociate into humic and fulvic acids more readily and can be effectively removed or reduced.

3. According to O'Melia and Dempsy, 1981, for dilute systems (TSS$\leq$50 mg/L kaolin and TOC$\leq$25 mg/L-C) the optimum pH ranges for turbidity and humic removal are 6.5 to 7.5 and 6 to 7, respectively. The EEWTP influent has a median TSS of 14 mg/L and TOC of 4.0 mg/L-C.

The jar test procedure outlined in Table I.1-1 was followed with the modification of a one hour settling period using Imhoff cones. Again, jar test data were analyzed according to improved turbidity and UV absorbance reductions. Also, chemical costs were calculated for the alum and alum/Betz 1160P combinations.

Discussion. Plots of removal isopleths were prepared, comparing percent turbidity removal and percent UV absorbance reduction for alum dose versus Betz 1160P dose. Percent residual turbidity and UV absorbance associated with alum/Betz 1160P combinations were derived from these plots and used in the following two equations to calculate normalized residual turbidity and UV absorbance.

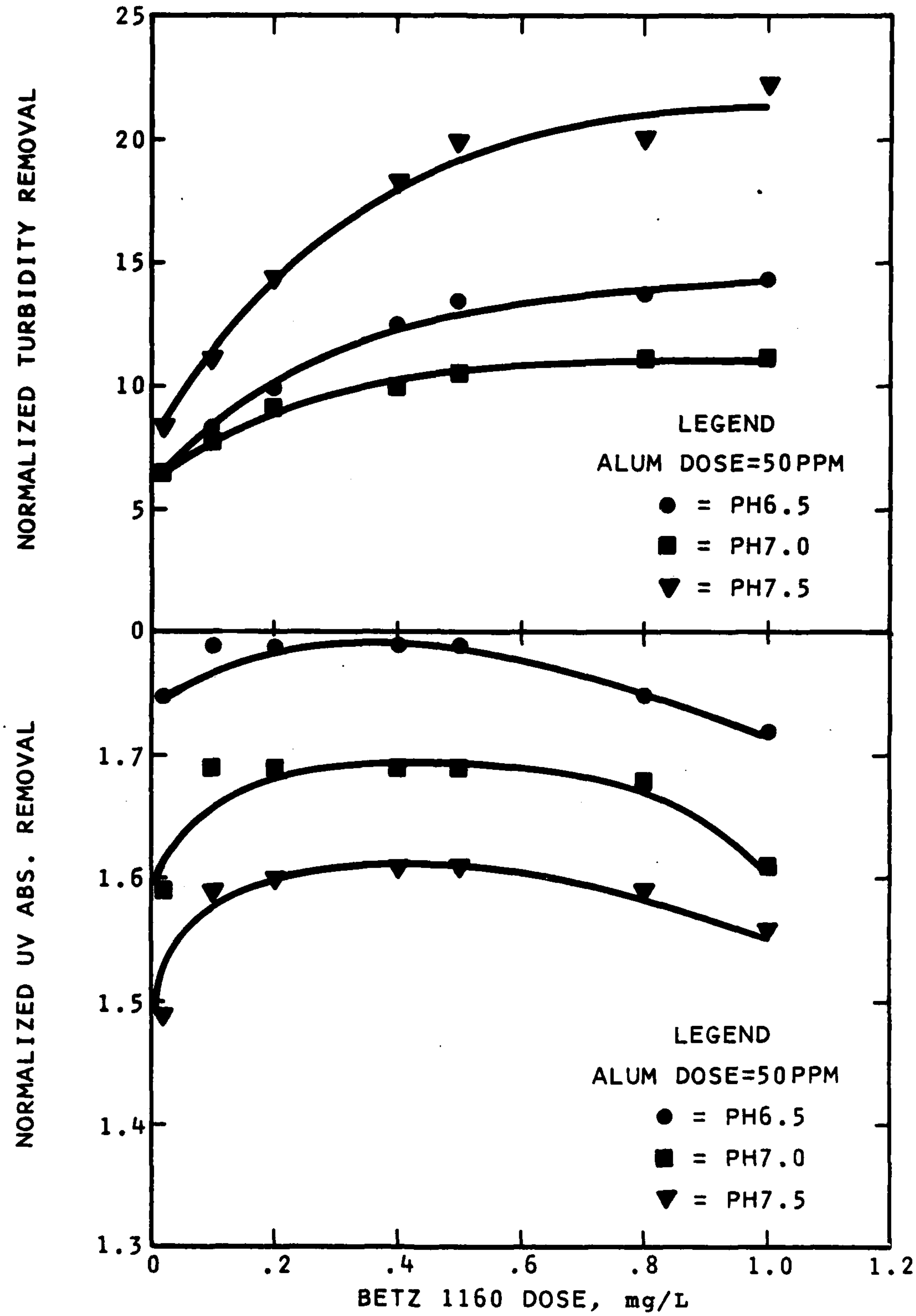
$$\text{Normalized Removal} = \frac{100\%}{\%\text{ Residual Turbidity}}$$

$$\text{Normalized Removal} = \frac{100\%}{\%\text{ Residual UV Abs.}}$$

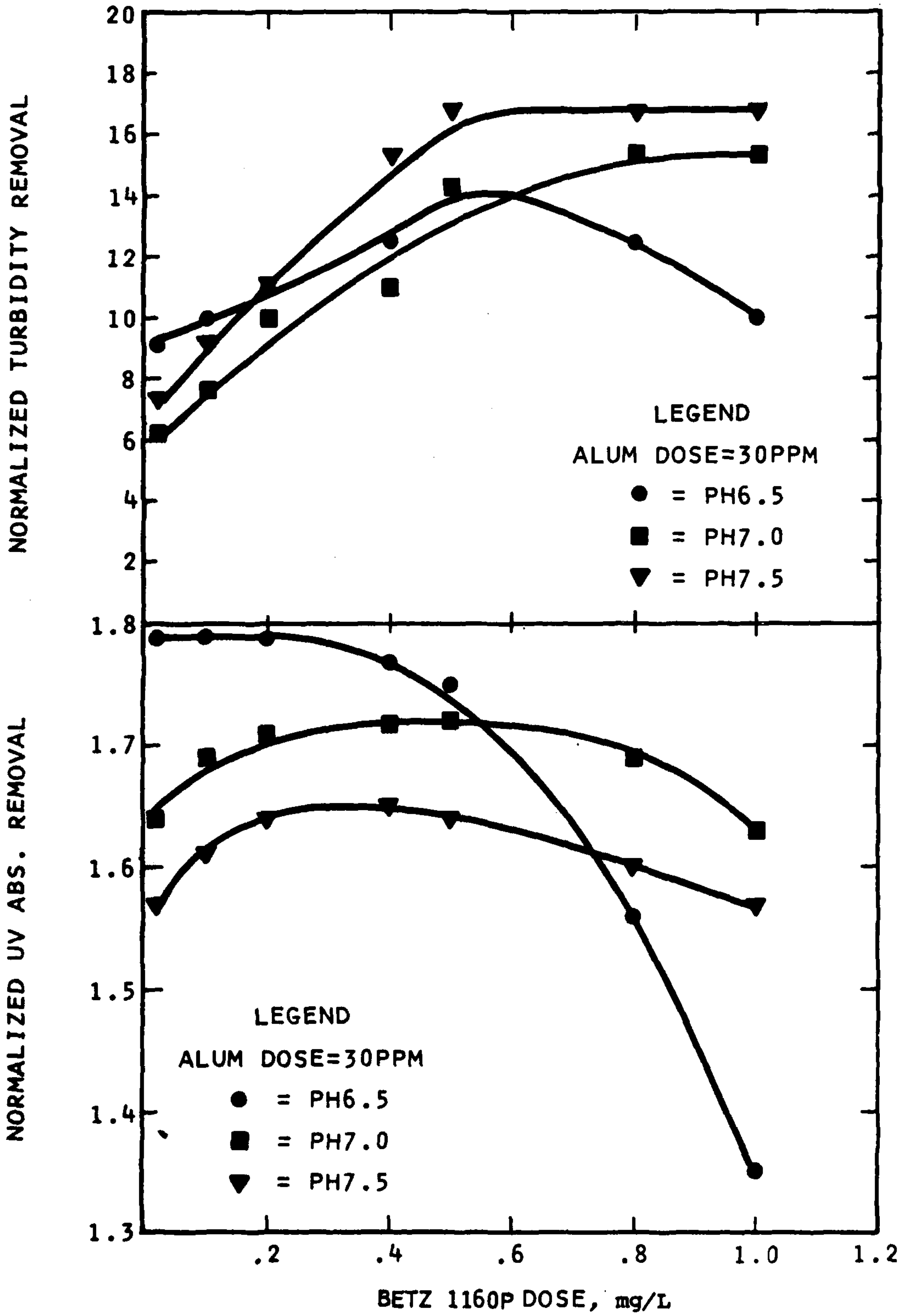
The 100 percent represents no removal of either turbidity or UV absorbance and % residual is the percent of either variable, present in the beaker supernatant, after coagulation/sedimentation. When plotted, normalized removals accentuate variations between removal data which otherwise would be interpreted as nearly constant over the coagulant dose range.

Figures I.1-2, I.1-3 and I.1-4 represent Betz 1160P dose versus normalized turbidity and UV absorbance removals at the constant alum doses of 50, 30 and 15 mg/L, respectively. The following is noted:

1. Turbidity removal increases with an increasing dose of Betz 1160P.

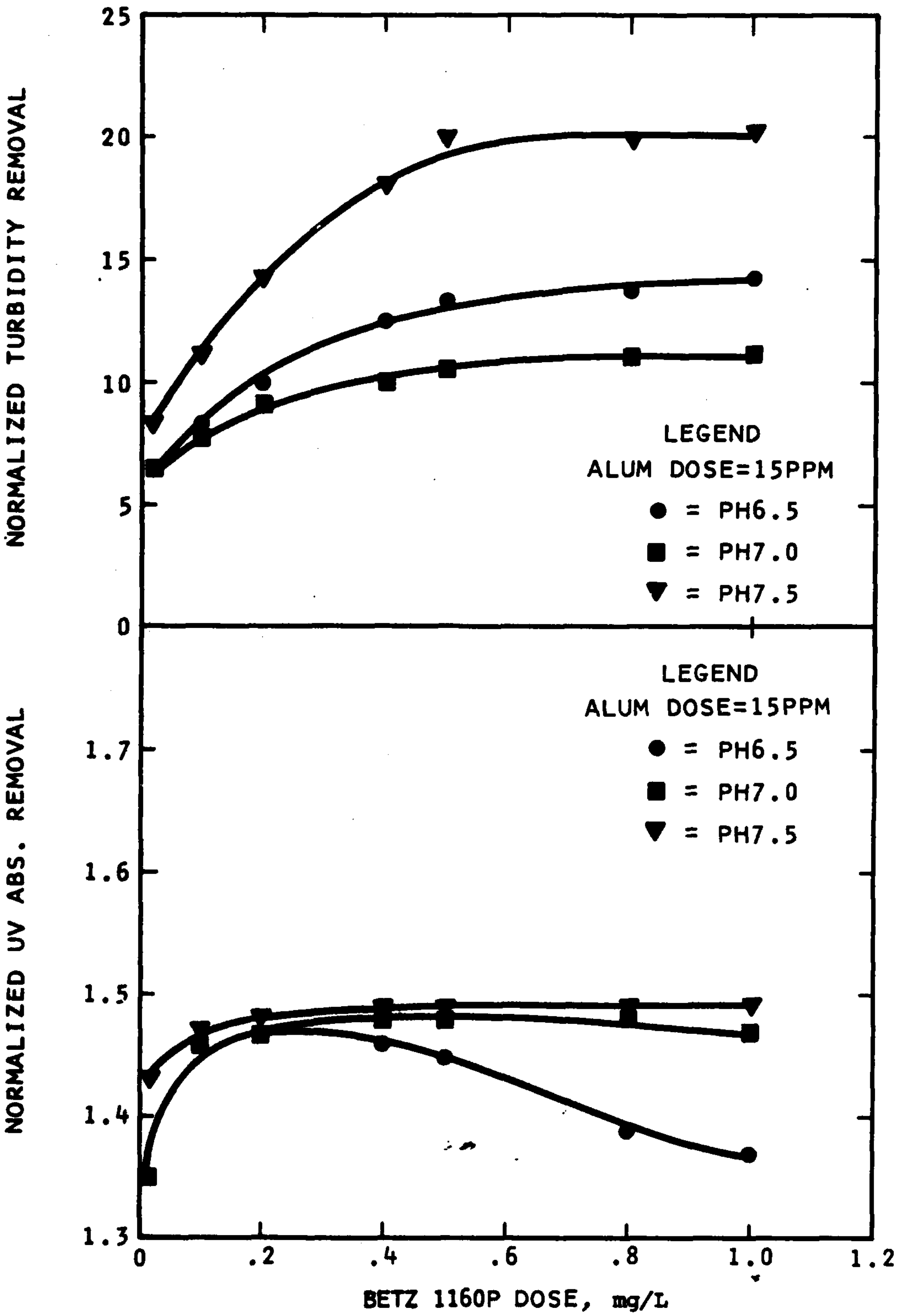


JAR TEST RESULTS WITH
50 PPM ALUM/BETZ 1160P
FIGURE I. 1-2



JAR TEST RESULTS WITH 30 PPM ALUM/BETZ 1160P

FIGURE I. 1-3



JAR TEST RESULTS WITH
15 PPM ALUM/BETZ 1160P
FIGURE I. 1-4

2. No trend was observed with respect to the relationship between turbidity removal and pH. Turbidity removal varied with pH, but in an inconsistent manner.

3. UV absorbance removal at each pH tested remained constant over most of the 0 to 1 mg/L Betz 1160P dosage range.

4. The figures indicate that UV absorbance removal fluctuates with increasing alum dose and increasing pH. At 15 mg/L alum, UV absorbance removal increases with increasing pH, but at 50 mg/L alum it decreases with increasing pH.

Sludge volume is another variable of concern and was measured during the experiments. Reductions in sludge volume did occur when the alum/Betz 1160P combination was used. However, in comparison to the volumes produced when alum is used as the sole coagulant, reductions were minimal (0.5 to 1.0 ml/L) for approximately equal turbidity removals.

Conclusion. Based on the above results, a cost analysis was made. Table I.1-3 is a summary of selected results indicating potential cost benefits achievable with an alum/Betz 1160P combination. The table was developed utilizing the following criteria and assumptions.

Target Removals	Chemical Costs
Turbidity 90%	Alum - 147 \$/ton (48.5% soln)
UV Abs. 40%	Betz 1160P - 3.68 \$/lb. (dry)

$Q = 0.5$ mgd

Only alum doses above 15 mg/L meet the removal goals.

This analysis indicates that benefits could be realized through the use of an alum/Betz 1160P combination. Chemical costs could be reduced significantly by replacing alum with a combination of alum and Betz 1160P. If the pH were to be raised in the plant for corrosion control and as an aid for manganese removal, then the alum/Betz 1160P combination would be even more advantageous, relative to alum alone.

On the basis of these results, Betz 1160P was used as a coagulant aid at plant-scale; however, the resulting turbidity and TOC removals were below those achieved in the bench-scale tests. The advantage in using Betz 1160P was its ability to agglomerate the coagulated particulate matter into larger more tightly bound flocs than those formed with alum alone. These larger, more dense flocs settled in the sedimentation basin and did not resuspend in the basin when the surface water was agitated by the wind, such was the case with the alum alone flocs.

TABLE I.1-3

SELECTED ALUM/BETZ 1160P TEST RESULTS AND COST ESTIMATES

pH	Alum ppm	Betz 1160P ppm	% Turbidity Removal	& UV Abs. Reduction	Sludge Vol. ml/L	Cost $/day
6.5	50	0	85	43	7	15.35
		.1	88	43+	7.5	16.85
		.2	90	43+	7	18.45
	30	0	83	42	5	9.2
		.02	88	43-44	4.5	9.5
		.15	90	43-44	4	11.50
7.0	50	0	83+	38	7	15.35
		.1	88	41	7	16.85
		.4	90	41	6.5	21.50
	30	0	84	38	6	9.2
		.15	88	41	5	11.50
		.25	90	41-42	4	13.00
		.4	92	42	3	15.35
7.5	50	0	84	35+	5.5	15.35
		.05	90	36	6	16.85
		.15	92	38	6	17.65
		.5	95	38	5.5	23.00
	30	0	86+	35	5	9.2
		.05	88	38	4.5	10.00
		.15	90	38	5	11.50
		.25	92	39	4.5	13.00

Coagulation and Filter Aid Selection

The following five polymers were selected for Phase 3 testing for evaluation as possible coagulant or filter aids. Selection was based on the information summarized in Table I.1-2 and previous experience.

	Molecular Weight	Charge	Charge Density
Betz 1160P	H	+	L
Magnifloc 572C	L	+	H
Hercofloc 1018	L	-	H
CA 253	H	-	M
CA 233	L	0	0

NOTE: H = high, M = medium, L = low

Five jar tests were conducted according to the procedure outlined in Table I.1-1. The polymers were tested in combination with alum at 50 mg/L (the plant-scale dosage) and the results were evaluated based on turbidity and TOC removals. For each polymer tested, one of the beakers in the jar test contained alum alone at the constant 50 mg/L dose. Results for the coagulant/filter aid jar tests are shown in Table I.1-4.

TABLE I.1-4

COMPARISON OF COAGULANT AIDS[1]

Polymer	Optimum Dose mg/L	Raw		Supernatant		Filtrate[2]	
		Turbidity NTU	TOC mg/L-C	Turbidity NTU	TOC mg/L-C	Turbidity NTU	TOC mg/L-C
Betz 1160P	.05	13	5.6	1.4	4.2	.15	4.2
Magnifloc 572C	.50	11	4.2	1.0	2.9	.10	2.8
Hercofloc 1018	.25	13	5.7	.85	3.9	.15	4.3
CA 253	.25	12	7.3	.60	5.0	.15	5.5
CA 233	.50	12	7.1	1.4	4.4	.15	4.6

1. Alum dose held constant for each jar test at 50 mg/L
2. 200 ml of supernatant filtered through a Gelman glass fiber filter

Discussion. The results summarized above reflect the data for alum plus the optimum polymer dose for each jar test. The median removals achieved by alum, at 50 mg/L, in the supernatant were 89 percent and 26 percent for turbidity and TOC, respectively. The data in Table I.1-4 suggest that the best removals of turbidity and TOC after settling only are produced by alum plus CA 253 and alum plus CA 233 with TOC removals of 31 and 38 percent, respectively.

Once the supernatant was filtered, the final turbidities were either 98 or 99 percent for each alum/polymer combination. All of the polymers tested in combination with alum in Phase 3 provided good turbidity removal after settling and filtering; greater than 85 percent and 98 percent, respectively. TOC values remained relatively unchanged before and after filtration. A slight TOC increase did occur for some combinations through filtration. However, the TOC increases are less than or equal to the acceptable confidence limit of ten percent. The order of increasing TOC removal produced by the alum/polymer combinations is as follows:

Betz 1160P
Magnifloc 572C/Hercofloc 1018/CA 253
CA 233

Conclusions. Two polymers were selected for full scale testing with two weeks of testing per polymer. The non-ionic, CA 233 was selected based on the TOC removal suggested by the jar test. Of the three polymers which produced equivalent TOC removals, two are anionic polymers and one is a cationic polymer, as previously identified. An anionic polymer, Hercofloc 1018, was selected as the second polymer for further testing.

CA 233 and Hercofloc 1018 were tested during January 1981. The results of the plant-scale evaluation were similar to the alum/Betz 1160P combination at plant-scale. Neither of the coagulant aids, when used with alum at plant-scale, improved turbidity and TOC removal, which is contrary to the results indicated by the jar tests. However, both polymers did help to keep the floc settled. Hercofloc 1018 is the least expensive of the three (Betz 1160P, CA 233 and Hercofloc 1018); therefore, it was used in the plant to maintain a settled floc.

Alum Coagulation of Influent Streams

The tests conducted during Phase 4 were designed to investigate the potential filterable organic carbon (FOC) and non-filterable organic carbon (DOC)[1] removals which can be achieved by alum, the primary coagulant. These tests provided information pertaining to the fractions of TOC removable by alum as well as providing a baseline to which other coagulants or coagulant combinations could be compared. Test results are shown in Table I.1-5.

It is important to note when reviewing the data in Table I.1-5 that the water samples were not all collected on the same day. The Blue Plains nitrified effluent and Potomac River estuary sample waters were collected in the same day at the same time. However, the blend tank water was collected the following day, and had an increased raw water TOC value.

Discussion. Table I.1-5 summarizes the data collected from three jar tests with alum, in each of the following raw waters; nitrified effluent, estuary and blend. The turbidity removal for each test, after settling, was greater than ninety percent and is, therefore, not reported in Table I.1-5. The results indicated an increase in turbidity removal with increased alum dose.

The TOC values presented in Table I.1-5 reflect very little, if any, change for each sample before and after filtering. The variations in TOC values which do occur are within the confidence limit of ten percent.

1 In this report, non-filterable TOC is assumed to be representative of dissolved organic carbon (DOC) and is frequently referred to as DOC.

TABLE I.1-5

ALUM COAGULATION RESULTS
NITRIFIED EFFLUENT/ESTUARY/BLEND

Alum Dose mg/L	Nitrified Effluent[1] TOC[2] mg/L-C	Nitrified Effluent[1] DOC[3] mg/L-C	Estuary[1] TOC mg/L-C	Estuary[1] DOC mg/L-C	Blend[1] TOC mg/L-C	Blend[1] DOC mg/L-C
20	4.0	3.9	2.9	2.8	3.3	3.2
40	3.8	3.5	2.8	2.7	3.0	3.0
80	3.3	3.3	2.6	2.6	2.9	2.8
120	3.3	3.1	2.6	2.4	2.8	2.8
160	3.1	3.3	2.6	2.3	2.7	2.8
240	3.0	3.2	2.3	2.5	2.7	2.8

1. Raw water TOCs for the nitrified effluent, estuary and blend were 4.8, 3.7, and 6.5 mg/L-C, respectively.
2. TOC after settling mg/L-C.
3. TOC after filtering settled supernatant through a glass fiber filter.

The results indicate that the particulate TOC is easily removed by alum; however, the dissolved TOC fraction is difficult to remove even at high alum doses. Also, the percent TOC removals for the nitrified effluent and estuary waters suggest that alum reacts to the same degree with the TOC fractions in each of the two influent streams. Median removals from 20 to 32 percent were obtained for both of these particular jar tests when alum doses were increased from 20 to 240 mg/L, respectively.

Conclusion. Because this set of jar tests indicates that DOC is more difficult to remove than FOC from the influent waters, DOC was the parameter used for the evaluation of the final alum phase jar tests.

Alum and Polymers as Primary Coagulants

The jar tests conducted in this phase can be separated into two groups. First, alum and each of the polymers selected were tested as single primary coagulants. Second, alum and each polymer were tested as primary coagulant combinations. DOC as well as turbidity were the parameters used to evaluate the test results. The three polymers selected for this phase of the coagulation study, shown below, were chosen because previous results, (Arco, 1981 and Narkis and Rebhun, 1981) indicate that they function well as primary coagulants. These polymers are not among the original twenty-one summarized in Table I.1-2.

	Molecular Weight	Charge	Charge Density	Maximum EPA Recommended Dose, mg/L
Purifloc C-31	L	+	H	5
Arco 6320	L	+	H	20
Arco 6440	L	+	H	50

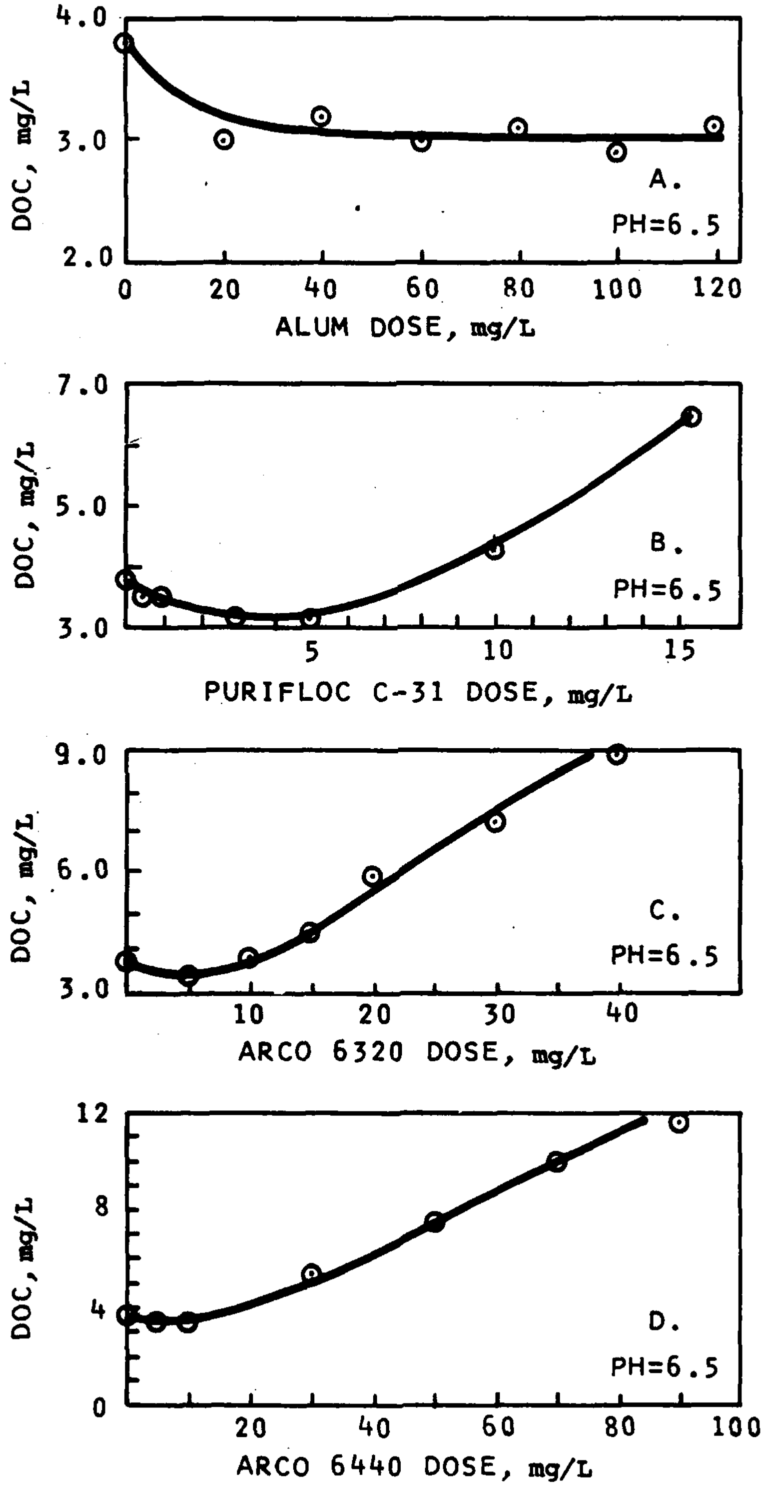
Discussion. The DOC removals produced by each primary coagulant are shown in Figure I.1-5. Figure I.1-5A is the DOC removal curve for alum and indicates 1) alum can remove DOC (twenty percent for this particular test), 2) DOC removal begins to plateau at low alum doses, and 3) very high dosages of alum have no significant effect on DOC removal. DOC removal curves for the polymers indicate that some DOC removal, eight to sixteen percent depending on the polymer, occurs at the low polymer doses, 5 mg/L and below. As the dose of each polymer was increased, above 5 mg/L in these tests, the DOC concentration detected also increased. These increases in DOC were probably caused by the presence of excess polymer in solution. Each of the three polymers' structure contains carbon which could add DOC at the excess dosages.

The settled turbidities for the alum jar test were ≤0.5 NTU and represented removals of 97 percent or better. Removals increased with increasing alum dose. Percent removals in turbidity for each of the three polymers ranged from 48 to 64 percent. Based on these turbidity removals the polymers did not perform as well as alum. However, the polymer test results indicate that some DOC removal is achievable and that further testing was warranted.

The data summarized in Table I.1-6 were produced by testing alum in combination with each of the three polymers. An alum dose of 40 mg/L was added to each beaker prior to the polymer addition, as previously described. Both the settled turbidity data and the DOC data indicate that the primary coagulant combinations do not provide any significant additional removals as compared to alum alone.

Conclusion. Each coagulant was tested as a primary coagulant in the first set of jar tests. As indicated by the discussion above and Figure I.1-5, the polymers did not perform as well as alum in terms of settled turbidity and DOC removal.

However, because some DOC removal was achieved with each polymer, further testing with alum/polymer combinations was pursued. Again, as with the first set of tests, no significant improvement in the removals of turbidity or DOC were achieved with the primary coagulant combinations relative to the use of alum alone.



DOC REMOVAL BY PRIMARY COAGULANTS
FIGURE I. 1-5

TABLE I.1-6

DOC REMOVAL BY PRIMARY COAGULANT COMBINATIONS

Coagulant Dose mg/L	Settled[2] Turbidity, NTU	DOC[3] mg/L-C
Alum 40	0.25	2.9
Purifloc C-31[1]		
1.0	0.75	3.1
3.0	1.00	3.1
5.0	1.40	3.2
Arco 6320[1]		
1.0	0.35	3.3
3.0	0.35	3.5
5.0	0.35	3.2
Arco 6440[1]		
3.0	0.95	3.0
5.0	0.95	2.8
10.0	1.00	3.1

1. Alum dose held constant at 40 mg/L; alum was added first
2. Raw water turbidity was 40 NTU
3. Raw water DOC was 4.2 mg/L-C

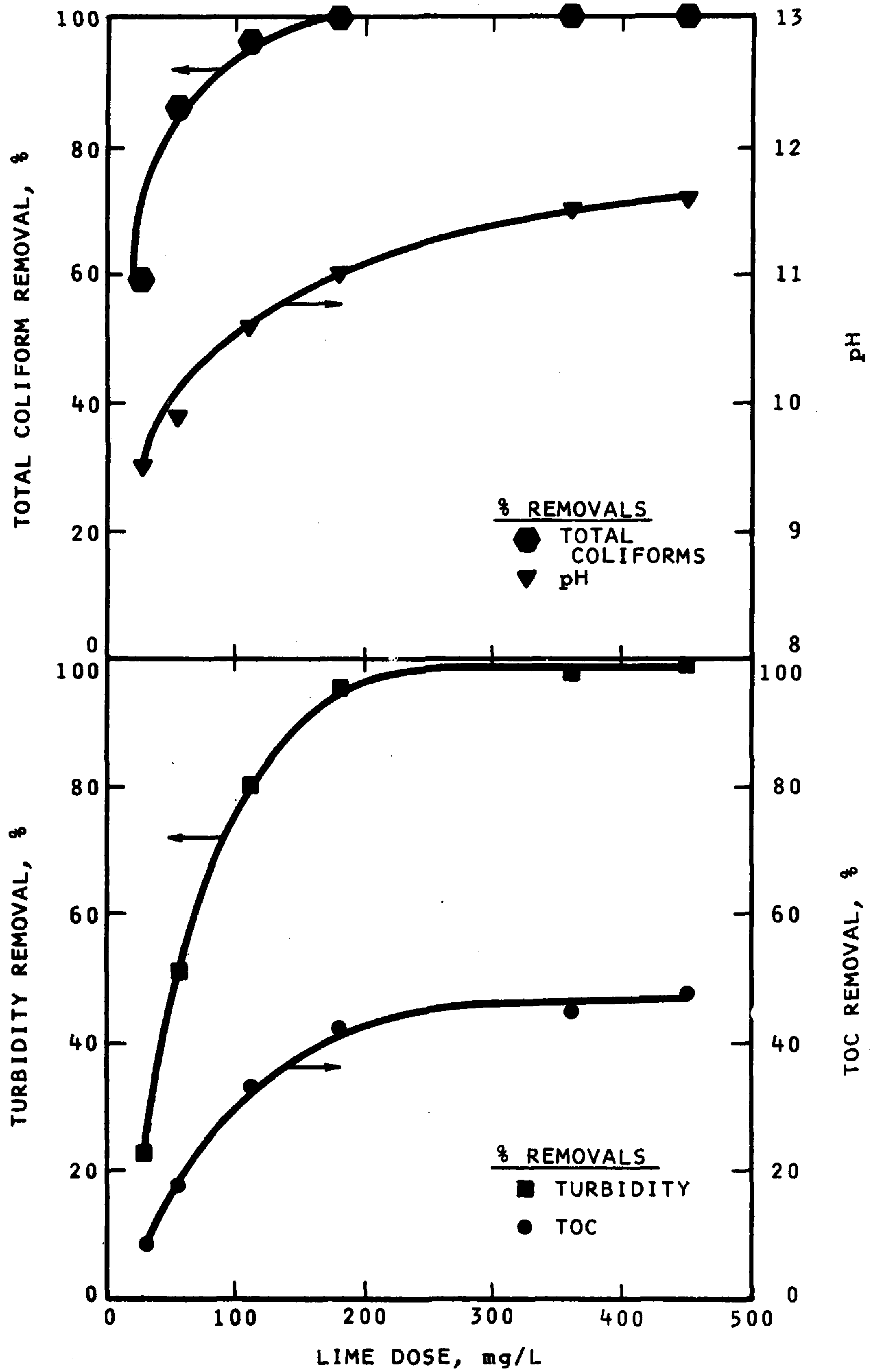
LIME

Lime - Sole Coagulant

Lime Without Coagulant Aid. Phase 1a of the lime coagulation tests involved an evaluation of lime as the sole coagulant and pre-disinfectant. Two jar tests were conducted, without pH control, using a range of lime doses from 25 to 450 mg/L-CaO. The experimental protocol outlined in Table I.1-1 was utilized with the addition of initial and final total coliform analyses (MPN). The MPN analysis was used to determine the capability of the lime to remove and/or inactivate the coliforms present in the water.

Discussion. Figure I.1-6 is a graphical summary of the turbidity, TOC and MPN removals achieved as the lime dose was increased. The results of the testing indicate that the greatest increase in percent removals occurred up to 100 mg/L-CaO and reached a plateau at approximately 200 mg/L-CaO. maximum removals for turbidity, TOC and MPN were 99, 47 and 100, respectively.

A comparison of the lime and alum coagulation (see Figure I.1-1) results indicate that equivalent removals are achieved for turbidity; however, lime doses $\geq$ 200 mg/L-CaO removed ten percent more TOC than alum, based on UV adsorbance. The UV-TOC correlation for the alum coagulation work suggested a 1.2 UV to TOC percent removal ratio; therefore, lime does $\geq$ 200 mg/L-CaO



JAR TEST RESULTS-LIME AS SOLE COAGULANT
FIGURE I. 1-6

AD-A136 866 OPERATION MAINTENANCE AND PERFORMANCE EVALUATION OF THE POTOMAC ESTUARY E..(U) MONTGOMERY (JAMES M) CONSULTING ENGINEERS INC PASADENA CA J M MONTGOMERY SEP 83 7/9

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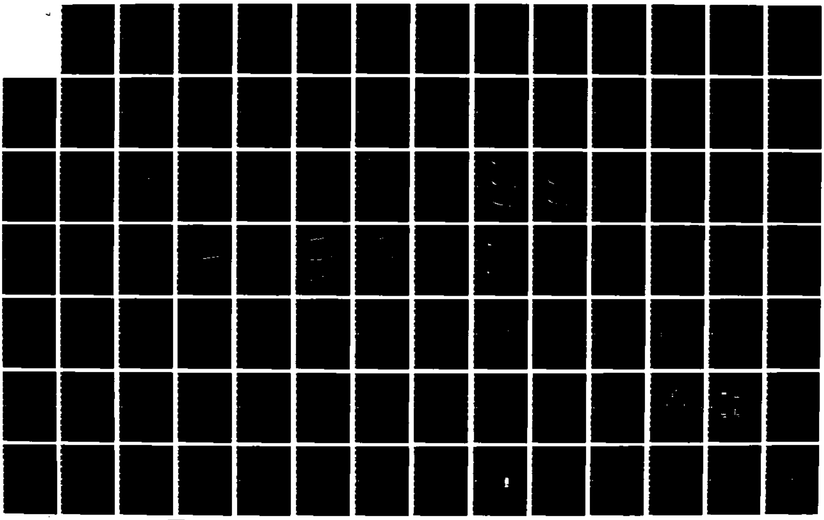
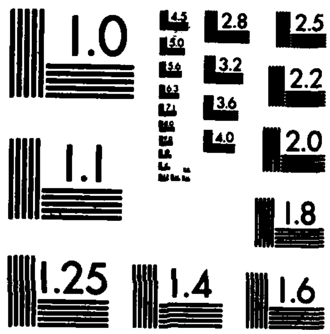




MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

removed fifteen percent more TOC than alum. Lime has the added benefit of providing significantly improved disinfection. A lime dose of 180 mg/L-CaO corresponded to a pH=11.0 and produced a 100 percent total coliform removal or inactivation. With lime coagulation; however, is the added necessity to recarbonate the water to reduce the pH following sedimentation.

A detriment which occurred when lime was used as a coagulant was the increase in the total hardness concentration of the finished water. The arithmetic mean concentration of total hardness in the EEWTP blended influent was 150 mg/L-$CaCO_3$. Concentrations of 140 to 650 mg/L-$CaCO_3$ for total hardness were produced by lime additions of 25 to 450 mg/L-CaO, respectively, in the jar test experiments. Na_2CO_3 can be used as a control for water hardness by its ability to increase the buffering capacity of water through the addition of alkalinity. The next step in Phase 1 was to evaluate this possibility.

Conclusion. The lime jar test results indicate equivalent or better turbidity and TOC removals can be achieved when compared to alum. Lime coagulation has the added benefit of providing disinfection, up to 100 percent total coliform removal or inactivation. A detriment associated with lime coagulation is the probable outcome of increasing the total hardness concentration in the finished water. Na_2CO_3 was selected to be tested as a control for total hardness in Phase 1b.

For the coagulation experimental work the following interpretation of total hardness concentrations was used: 0 to 100 mg/L-$CaCO_3$ = soft water, 100 to 200 mg/L-$CaCO_3$ = medium hard water and 200 mg/L-$CaCO_3$ or greater = hard water. The jar test results indicate that a lime dose of 200 mg/L-CaO would be the approximate dosage used in plant-scale operation for turbidity and TOC removal as well as disinfection. However, the high total hardness, 280 mg/L-$CaCO_3$ associated with the 200 mg/L-CaO dose would produce an aesthetically distasteful water to the consumer.

Lime Plus Soda Ash (Na_2CO_3). Phase 1b jar tests were conducted to evaluate the capability of Na_2CO_3 to reduce the high total hardness, 280 mg/L-$CaCO_3$, associated with a lime dose of 200 mg/L-CaO. The jar test experimental protocol outlined in Table I.1-1 was followed for each of the four tests conducted. Lime doses of 40 to 200 mg/L-CaO were used in the tests with Na_2CO_3 doses ranging from 25 to 350 mg/L.

Discussion. The lime/Na_2CO_3 test results indicate either equivalent or reductions in turbidity and TOC removals occurred at equivalent lime doses when compared to the lime alone tests. Reductions in turbidity removal up to fifty percent and TOC removal of up to twenty percent were produced by the lime/Na_2CO_3 combinations. These reductions in removal were probably due to the increased production of colloidal solids. Lowering of the pH by the buffering capacity of the soda ash could also have been a factor. As a result, the lime dose required to achieve eighty percent turbidity removal was 200 mg/L-CaO. Corresponding Na_2CO_3 requirements were approximately 100 to 150 mg/L. The total hardness concentration associated with this dose combination was 204 mg/L-$CaCO_3$, indicating a hard water quality. Reductions

in total hardness up to eighty percent were achieved by use of the lime/Na_2CO_3 combination but the associated turbidity and TOC removals were reduced.

Conclusion. The lime/Na_2CO_3 jar test results indicate a total hardness reduction of eighty percent can be achieved but at the expense of reducing turbidity and TOC removals. To achieve the turbidity and TOC removals obtained with lime alone the lime and Na_2CO_3 doses would have to be 200 mg/L-CaO and 150 mg/L-Na_2CO_3, respectively. The implications of higher doses with respect to chemical cost, sludge volume production and resulting sodium concentrations[1] lead to the conclusion that alkalinity addition is not the most cost effective solution for reducing total hardness. Attention was therefore focused on potential coagulant aids for the reduction of lime dosage requirements and corresponding total hardness.

Lime Plus Coagulant Aids

Phase 2 of the lime coagulation work entailed an experimental evaluation of potential coagulant aids. A testing program with six polymers was conducted and then a set of jar tests with $FeCl_3$ was completed. The six polymers selected for the jar tests were chosen from the list of polymers tested in Phases 2 and 3 of the alum coagulation work.

	Charge		Charge
Betz 1160P	+	Hercofloc 1018	-
Magnifloc 572C	+	CA 253	-
Cat Floc T	+	CA 233	0

Jar testing experimental protocol followed the procedure outlined in Table I.1-1 for two coagulant additions. A lime dose of 100 mg/L-CaO was used for the lime/polymer tests while 50, 100 and 150 mg/L-CaO were tested with $FeCl_3$. Polymer doses of 0.1 to 2 mg/L and $FeCl_3$ doses of 1 to 10 mg/L were used in the coagulant aid jar tests. MPN analyses were not conducted. Any additional total coliform removals achieved through improved coagulation would have been insignificant compared to the kills achieved with increasing lime dose and/or pH.

Discussion. A concentration of lime at 100 mg/L-CaO as the sole coagulant produced 75 and 30 percent removals of turbidity and TOC, respectively. Results of the lime/polymer jar tests are summarized in the table below. Four of the lime/polymer combinations increased turibidity removals zero to nine percent while two decreased it approximately nine percent. The removal of TOC was not improved by any of the combinations but instead was decreased from five to fourteen percent. This decrease may be due in part to TOC addition by the polymers, carbon being a component of each polymer's structure.

1. See Main Volume, Chapter 9 for a discussion of the potential adverse health impacts of sodium in drinking water.

Coagulation Studies

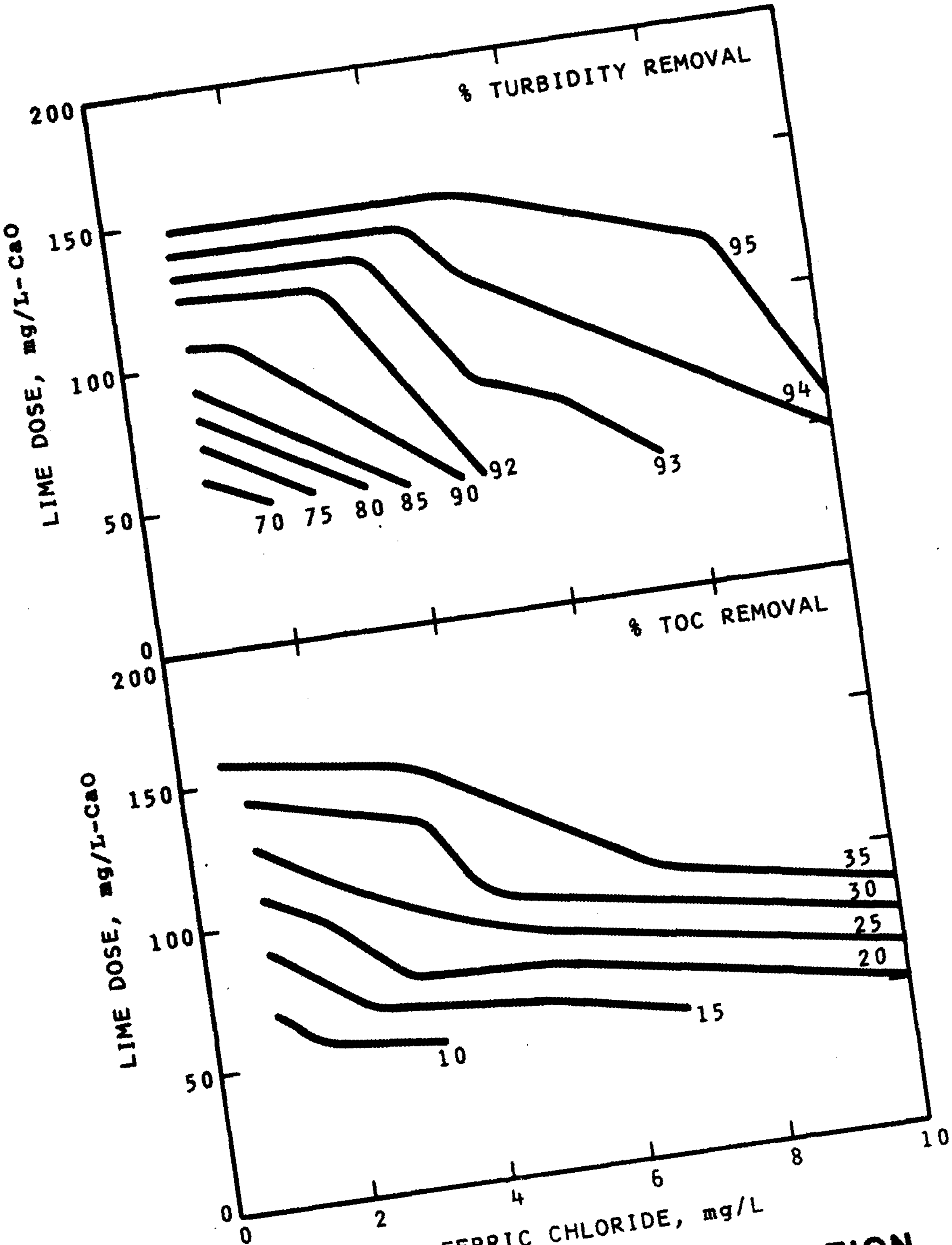
Coagulant	Optimum Dose Tested mg/L	Turbidity Removal %	TOC Removal %
Betz 1160P	0.1	79	25
Magnifloc 572C	2	86	15
Cat Floc T	2	76	20
Hercofloc 1018	0.5	66	14
CA 253	0.25	67	24
CA 233	0.5	75	21

The results of the lime/$FeCl_3$ tests are depicted in Figure I.1-7 which is comprised of two sets of isopleths, one each for turbidity and TOC. A summary of the increased turbidity and TOC removals achieved with lime versus lime/$FeCl_3$ is tabulated below.

Coagulant Dose	Turbidity Removal %	TOC Removal %
50 mg/L-CaO	45	16
+ 10 mg/L-$FeCl_3$	94	20
100 mg/L-CaO	75	30
+ 7 mg/L-$FeCl_3$	94	35
150 mg/L-CaO	90	37
+ 4 mg/L-$FeCl_3$	95	36

The $FeCl_3$ doses documented in the summary aided in the production of the best turbidity and TOC removals when combined with one of the three lime doses tested. Also, the information displayed in the summary pertains only to those dosages tested, increased removals could potentially be achieved at higher $FeCl_3$ dosages.

Conclusion. The results of the jar tests with lime/polymer combinations indicated that turbidity removal was improved while TOC removal was reduced. The lime/$FeCl_3$ tests indicated that both turbidity and TOC removals were improved to varying degrees based on coagulant dosages used. Lime/$FeCl_3$ combinations were tested at plant-scale at 150 mg/L-CaO and 2 to 4 mg/L-$FeCl_3$. A dose combination of 150 mg/L-CaO and 4 mg/L-$FeCl_3$ produced turbidity and TOC removals comparable to the jar tests while the lime decreased the total coliforms approximately 100 percent. This coagulant combination was selected and used for plant-scale operation.



LIME/FERRIC CHLORIDE COAGULATION
TURBIDITY AND TOC REMOVALS
FIGURE I. 1-7

CONCLUSIONS AND RECOMMENDATIONS

ALUM/POLYMER

The alum/polymer bench-scale and plant-scale work indicated that generally the alum/polymer combinations tested improved turbidity but hindered TOC removal as compared to the removals achieved with alum alone. Further investigation of the inability to increase TOC removal, even at high alum doses, revealed that DOC was the fraction of TOC most difficult to remove. Although additional TOC removal could not be achieved with coagulant aids, polymers were still used at plant-scale to improve the settling of floc in the sedimentation basin. Therefore, polymers can be used with alum to aid in the removal of particulate matter by improving the settling of floc. An optimum dosage combination of 50 mg/L-alum and 0.1 mg/L-polymer was used at plant-scale.

LIME

Lime as a primary coagulant produced results which indicate equivalent or better turbidity and TOC removals can be achieved when compared to alum. The increased total hardness concentration associated with the lime addition was controllable by addition of soda ash (Na_2CO_3); however, Na_2CO_3 addition decreased both turbidity and TOC removals. Coagulant aids were then tested with lime in an effort to lower lime dosage and the corresponding total hardness concentrations as well as improve turbidity and TOC removal.

Lime and lime/polymer jar test results suggest that only minor, one to nine percent, improvements in turbidity removal occurred when polymers were used as coagulant aids and TOC removal was decreased. Because polymers did not react well as lime coagulant aids suggests they should not be used in such a capacity and were not used at plant-scale.

Ferric chloride, on the other hand, improved both turbidity and TOC removals when used in combination with lime. Also, the $FeCl_3$ reduced the dosage of lime required to achieve comparable turbidity and TOC removals produced by lime alone. A reduction in lime dosage of approximately 25 percent occurred which corresponded to a total hardness reduction of 29 percent. A dosage combination of 150 mg/L-CaO and 4 mg/L-$FeCl_3$ was selected for plant-scale use. Lime, also provided approximately 100 percent total coliform removal at 150 mg/L-CaO. Lime/$FeCl_3$ was proven a beneficial coagulant combination and could be used together whenever necessary.

SECTION 2

FILTRATION STUDIES

BACKGROUND

INTRODUCTION

The primary objective of the filtration process has traditionally been to remove particulate matter and thus decrease the turbidity of the finished water. The EPA Primary Drinking Water Standards (USEPA, 1980) dictate that the maximum contaminant level for turbidity is 1 NTU. A more recent concern in the drinking water field is the level of organics in potable water. Therefore, the removal of organic parameters, such as TOC, by the filtration process is of interest, In the case of the EEWTP, removal of TOC in filtration may reduce subsequent costs for TOC adsorption on granular activated carbon. Finally, it is desirable to meet the objectives of the filtration process while minimizing costs.

Ideally, the objective of filtration is to obtain the maximum net water production from a filter while maintaining a filter effluent of desired quality. Three factors affect a filter's net water production: the filtration rate, the length of filter run, and the amount of water required for backwash. The net water production is the difference betwen the volume of water filtered and the volume of water required for backwash. A convenient method of describing filter production is the unit filter run volume (UFRV). The net water production is the amount of water a filter produces per square foot minus the amount of water per square foot required to backwash the filter.

Studies have shown that when the UFRV drops below 5,000 gal/ft^2/run, the efficiency of water production decreases. Thus, 5,000 gal/ft^2/run is the minimum UFRV desired.

Polyelectrolytes are commonly used in the coagulation/flocculation process. The polyelectrolyte molecules attach themselves to the surface of suspended particles, forming bridges between particles (Cohen and Hannah, 1971). The bridged particles settle more readily. The use of polyelectrolytes as filter aids in the filtration process aids the attachment mechanisms by which particles adhere to the filter media. By doing so, polyelectrolytes may aid in the removal of particulate organic matter.

The filtration process involves a constant tradeoff between effluent quality and operational cost. By performing pilot-scale studies, a number of the variables which influence filtration can be evaluated and the filtration process can be optimized.

OBJECTIVES

The objectives of the filtration studies were two-fold:

1. To examine the effect of the filtration rate on effluent water quality and filter headloss.

2. To investigate the performance of polyelectrolytes as filtration aids for TOC removal.

APPROACH

EXPERIMENTAL PLAN

Two types of pilot-scale filtration studies were performed: filtration rate studies and filter aid studies.

The filtration rate studies were performed to determine what filtration rate produced the optimum unit filter run volume while still maintaining an effluent within the stated requirements. Six filtration rate experiments were performed using three pilot-scale filter columns. These experiments evaluated filter performance at three surface loading rates: 3, 6 and 9 gpm/ft^2. The performance criteria were based on effluent turbidity and filter headloss. The maximum turbidity allowed was 0.2 NTU. A maximum of 100 inches headloss was allowed. Once either of these criteria was exceeded the filtration experiment was terminated.

Three filter aid experiments were performed. The objective of the filter aid experiments was to evaluate whether the addition of filter aids improved TOC removal. No turbidity or headloss standards were set.

METHODS

Equipment

Three pilot-scale filter columns were used for all filtration experiments. The filters were ten feet high PVC and fiberglass columns three inches in diameter, giving a 0.05 ft^2 surface area. The filter media consisted of twenty inches of anthracite coal (effective size approximately 1.0 mm) on ten inches of silica sand (effective size approximately 0.5 mm). This media replicated that which was utilized at the EEWTP. The underdrain and support system consisted of a fabric mesh screen to hold the media and distribute the backwash water. The pilot-scale filter columns did not contain gravel. The columns were automatically and continuously monitored for headloss through the use of a strip chart recorder.

Backwash equipment included a centrifugal pump and an air compressor with air scour. The backwash procedure consisted of the following:

- 10-20 percent bed expansion for 2 minutes
- simultaneous air scour for 6 minutes
- 50 percent bed expansion for 5 minutes

- gradual decrease in backwash flow to restratify bed
- terminate backwash

The filter column influent source water was taken from the influent to the full-scale filters (after coagulation with alum and coagulant aid 1018 Hercofloc amd settling).

Procedures

Six filtration run experiments were performed. During each experiment, three columns were operated at flow rates of 3, 6 and 9 gpm/ft^2. The headloss through each filter was recorded continuously. Measurements of the turbidity of the filtered water were made every four hours. Filtration was terminated when either the headloss reached the maximum level allowable (100 inches H_2O) or when the turbidity of the effluent exceeded 0.2 NTU.

In order to minimize differences (such as media compaction or gradation) among the pilot filters, the flow rate tested on each column was changed at least once during the course of the study. The initial clean bed headloss for a column at a particular rate of flow was determined by averaging the headloss at time zero for each of the columns under that flow rate. For example, to determine what the clean bed headloss through a column at 3 gpm/ft^2 was, the headloss for column 1 at time zero at 3 gpm/ft^2 was measured. The same measurement was made, during different runs, for columns 2 and 3. These values were averaged to give the typical initial headloss for any column operated at 3 gpm/ft^2. Similar values were calculated for 6 gpm/ft^2 and 9 gpm/ft^2. The initial, clean bed headloss subtracted from the maximum headloss allowable, 100 inches of water, yields the headloss available during filtration. For columns operating at 3 gpm/ft^2, the headloss available during filtration was 90 inches of water. For 6 gpm/ft^2, it was 87 inches, and for 9 gpm/ft^2, it was 79 inches.

Three filter aid experiments were performed using the pilot-scale filter columns. The objective of the filter aid experiments was to evaluate whether the addition of filter aids improved TOC removal. To make this evaluation, polyelectrolytes were added to the influent water on the suction side of the peristaltic pump feeding the column. Different amounts of polymer were added to each column. During an experiment, one of the three columns acted as a control. No filter aid was added to this column.

The filter aids used during the filter aid studies were Magnifloc 572C (an American Cyanamid product) and Pollu-Treat C31 (a Pollu-Tech product). Both of these filter aids are cationic polymers. The Magnifloc is a very low molecular weight polymer. Pollu-Treat C31 is a high molcular weight polymer. Both are commonly used in water treatment.

All three columns in the filter aid experiments were operated at 6 gpm/ft^2. To evaluate TOC reduction, 50 ml samples of the effluent from each column were taken every half hour. For each filter, these samples were composited and a TOC analysis was performed on the composite. This composite value was compared with the TOC of the influent.

All columns during filter aid experiments were started and stopped at the same time. The columns were operated 24 to 36 hours. Operation was terminated on the basis of time, not for headloss or turbidity reasons.

DISCUSSION OF RESULTS

FILTRATION RATE STUDIES

The results of the filtration rate experiments are shown in Table I.2-1. For each filter run, the loading rates, column corresponding to that loading rate, time to turbidity breakthrough, time to terminal headloss, unit filter run volume and the headloss development are listed. The unit filter run volume was calculated using the following equation:

$$\text{UFRV} = ((\text{Loading rate, gpm/ft}^2) \times (\text{Filter run time, hrs}) \times (60 \text{ min/hr})) - (\text{Unit backwash volume, gal/ft}^2)$$

The filter run time is the time to turbidity breakthrough or the time to terminal headloss, whichever is lower. The unit backwash volume was 200 gal/ft^2 for all columns in all experiments. The headloss development was calculated by dividing the headloss at the end of the filter run by the filter run time. Looking at Table I.2-1, it can be seen that filter run time was usually determined by the time to turbidity breakthrough. When a filter is optimally utilized, the time to turbidity breakthrough is nearly coincident with the time to terminal headloss. Terminal headloss should occur first.

The aim of the filtration rate study was to develop data to determine the optimum filtration rate. The optimum filtration rate maximizes the production of water of desired quality and minimizes the associated capital and operational costs. Capital and operational costs are not developed in this report. From Table I.2-1, it appears the filtration rate between 3 and 6 gpm/ft^2 will maximize production of the desired quality of water. A filtration rate of 6 gpm/ft^2 would most likely be preferable to 3 gpm/ft^2 since the average UFRV at 6 gpm/ft^2 is only twenty percent less than 3 gpm/ft^2, but the surface area of the filter could be cut in half.

FILTER AID STUDIES

Three filter aid studies were performed. Their results are shown in Table I.2-2. For each column during each filter run, the filter aid dose, composite TOC and percent TOC reduction were calculated. The percent TOC numbers are most important. These numbers appear to indicate that the use of filter aids did not significantly reduce effluent TOC. The addition of dissolved TOC from the polymers may be partially responsible for this finding.

During Filter Run 1, the column experiencing the highest TOC removal was the column to which no filter aid had been added.

During Filter Run 2, columns 1 and 2 had similar TOC removal efficiencies. Again, column 1 had no filter aid added.

For Filter Run 3, columns 2 and 3 had the highest TOC reduction. This reduction was not markedly higher than the reduction obtained in the column without filter aid.

Given the results of these experiments, it appears the use of filter aids did not improve TOC removal.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions of the filtration rate study are:

- An effluent turbidity goal of 0.2 NTU was met using a dual-media (anthracite and sand) gravity filter.
- Filtration rates of 3 and 6 gpm/ft^2 were possible while still maintaining a minimum unit filter run volume of 5,000 gpm/ft^2/run. At a rate of 9 gpm/ft^2, the UFRV fell below 5,000 gpm/ft^2/run.

The conclusion of the filter aid studies is:

- The cationic polyelectrolyte filter aids tested did not result in reduced effluent TOC.

The filtration pilot studies were not conducted over a sufficiently long period of time or under sufficiently varied influent conditions to allow for specific recommendations for full scale applications. Results did indicate, however, that higher filtration rates might be warranted and deserve further considerations. Based on the limited pilot scale results, a filtration loading rate of 6 gpm/ft^2 would be recommended in order to maximize the unit filter run volume, while minimizing costs and meeting stringent turbidity standards.

Based on the results from the two polyelectrolytes tested, the use of filter aids to enhance removal of organics during filtration could not be recommended.

TABLE I.2-1

RESULTS OF PILOT-SCALE FILTRATION RATE STUDY

	Loading Rate, gpm/ft²		
	3	6	9
Run No. 1			
Column	1	2	3
Time to turbidity breakthrough,hrs	not reached	23	8
Time to terminal headloss, hrs	63	30	23
Unit Filter Run Volume, gal/ft²	11,140	8,080	4,120
Headloss development, in/hr	1.6	2.6	3
Run No. 2			
Column	2	3	1
Time to turbidity breakthrough, hrs	58	18	10
Time to terminal headloss, hrs	77	53	13
Unit Filter Run Volume, gal/ft²	10,240	6,280	5,200
Headloss development, in/hr	0.97	2.2	6.2
Run No. 3			
Column	3	1	2
Time to turbidity breakthrough, hrs	47	24	10
Time to terminal headloss, hrs	115	30	23
Unit Filter Run Volume, gal/ft²	8,260	8,440	5,200
Headloss development, in/hr	0.98	2.6	4.4
Run No. 4			
Column	1	2	3
Time to turbidity breakthrough, hrs	not reached	26	16
Time to terminal headloss, hrs	66	38	27
Unit Filter Run Volume, gal/ft²	11,680	9,160	8,440
Headloss development, in/hr	1.52	2.19	4.06
Run No. 5			
Column	3	1	2
Time to turbidity breakthrough, hrs	not reached	40	14
Time to terminal headloss, hrs	78	40	16
Unit Filter Run Volumen, gal/ft²	13,840	14,200	7,360
Headloss development, in/hr	1.28	2.5	5.29
Run No. 6			
Column	1	2	3
Time to turbidity breakthrough, hrs	36	8	2
Time to terminal headloss, hrs	46	not reached	not reached
Unit Filter Run Volume, gal/ft²	6,280	2,680	880
Headloss development, in/hr	1.3	2.5	10.5
Average UFRV	10,240	8,140	5,200

1. Note: With the exception of Run No. 6, all filter runs were continued until headloss criterion was met for purposes of comparison. Time to breakthrough of 0.2 NTU turbidity was recorded

TABLE I.2-2

RESULTS OF PILOT-SCALE FILTER AID STUDIES

Column	Filter Aid Dose mg/L	Composite TOC, mg/L	% TOC Reduction
Filter Run Number 1 — Magnifloc 572C			
Influent to All Columns	-	3.6	-
1	0	3.4	5
2	1.0	3.6	0
3	1.0	3.6	0
Filter Run Number 2 — Magnifloc 572C			
Influent to All Columns	-	3.4	-
1	0	2.9	1[illegible]
2	2.5	2.8	18
3	5.0	3.4	0
Filter Run Number 3 — Pollu-Treat C31			
Influent to All Columns	-	2.8	-
1	0	2.7	4
2	1.0	2.5	11
3	5.0	2.5	11

SECTION 3

GRANULAR ACTIVATED CARBON

BACKGROUND

INTRODUCTION

With increasing concern over health effects of synthetic organic chemicals (SOCs) in drinking water supplies, a treatment barrier for control of these organic compounds may be necessary if the source is subjected to contamination. Adsorption onto granular activated carbon (GAC) is one such barrier, the principle SOC barrier employed at the EEWTP. While GAC may be considered as a viable option for controlling organic contaminants, it is also one of the most costly processes to construct and operate. Optimization of the GAC process withn respect to operation and design parameters is important for the production of a economically feasible process option.

Previous investigators have conducted studies of GAC adsorption for the removal of humic fractions (Lee, 1982, Randtke and Christopher, 1982, and Roberts and Summers, 1982), desorption of synthetic organic chemicals (Thacker et al., 1981) and applications of the Homogeneous Surface Diffusion Model (HSDM) for design (Hand et al., 1981 and Lee et al., 1982). In all cases, however, model adsorbates have been used. The tests conducted during this project involve the application of previously-developed experimental methods and the HSDM using the EEWTP influent water, a fifty/fifty mix of nitrified wastewater effluent and tidal fresh estuary water from the Potomac River. Two chemical pretreatments, alum/polymer and lime coagulation followed by sedimentation, and filtration were tested during the GAC adsorption study.

OBJECTIVE

The main objective of this study was to develop design criteria for a 200 MGD GAC facility designed for TOC removal.

APPROACH

SELECTION OF APPROACH

<u>Surrogate Parameter</u>

The purpose of the GAC process is to remove and/or reduce the concentration of synthetic organic contaminants (SOC) in the finished water. Adsorption models are not designed to handle a large variety of SOCs interactively competing for adsorption sites. On the other hand, selection of one or two specific SOCs to model for design evaluation is also problematic. The two main problems with this approach are:

1. Uncertainty as to which SOCs to select in order to ensure conservative GAC design and operation.

2. Plant operation based on the daily monitoring of the selected SOC(s) is not practical. Operators require information which can be readily obtained and SOC analyses are time consuming.

With these considerations in mind, a surrogate parameter was chosen for the experimental and design work. Selection of the surrogate was based on adsorbility and ease of analysis. If the surrogate is less adsorbable than the SOCs of concern then a design based on its adsorption properties would be conservative for SOC adsorption. TOC is generally adsorbed more slowly than previously studied SOCs, as will be discussed later, and can be readily analyzed by UV Absorbance at 254 nm; therefore, it was selected.

The study's experiments, modeling, and design work were based on TOC adsorption. Because TOC has not been evaluated in terms of health effects and/or risks, it is important that final TOC criteria for design be sufficiently conservative to ensure that the GAC process provides an effective organics barrier. For this reason, a range of TOC goals were utilized in developing process design criteria. In addition, a specific SOC of concern was selected and adsorption parameters developed for independent evaluation of the preliminary GAC process design. Details of the study program are discussed in a following section, "Experimental Plan."

Model

In order to develop optimum design criteria for the GAC process, the HSDM was used as a tool for evaluating the cost effectiveness of various design parameters, including empty bed contact time (EBCT), type of carbon (lignite versus bituminous), contactor configuration, effluent regeneration criteria (various final TOC levels), and pretreatment (alum/polymer versus lime coagulation).

The HSDM was provided by Dr. John C. Crittenden of Michigan Technological University, the project GAC consultant. Selection of the HSDM for this study was based on its applicability to produce information pertaining to the evaluated design parameters and user oriented format. The program consists of two main components, a batch model and a column model, HSDBM and HSDCM. The main assumptions incorporated into the model are as follows:

1. Surface diffusion is the predominant intraparticle mass transfer mechanism, not a function of concentration.

2. No radial dispersion or channeling, concentration gradients only in the axial direction.

3. Constant hydraulic loading.

4. Liquid-phase flux described by linear driving force approximation.

5. Adsorbent is in a fixed position, backwashing not considered.

6. Adsorption equilibria can be described by Freundlich isotherm equation.

7. Plug flow valid only if the mass transfer zone (MTZ) is longer than thirty adsorbent particle diameters.

Numerical solution of the HSDM equations is accomplished by using orthogonal collocation and a subroutine refined by Hindmarsh, 1974 called GEAR.

Previous experience with the HSDM has primarily involved the development of HSDM parameters for model adsorbates such as humic acid fractions or specific SOCs. Therefore, to enhance the capability of the HSDM to accurately model adsorption of the complex collection compounds which comprise TOC, an experimental program was established to define adsorption parameters for the model.

EXPERIMENTAL PLAN

Figures I.3-1 and I.3-2 are schematics of the stages in the experimental plan for TOC and SOC, respectively. The work for both parameters was conducted simultaneously. Selection of the test carbons and a SOC were the first stages in the study and are discussed below

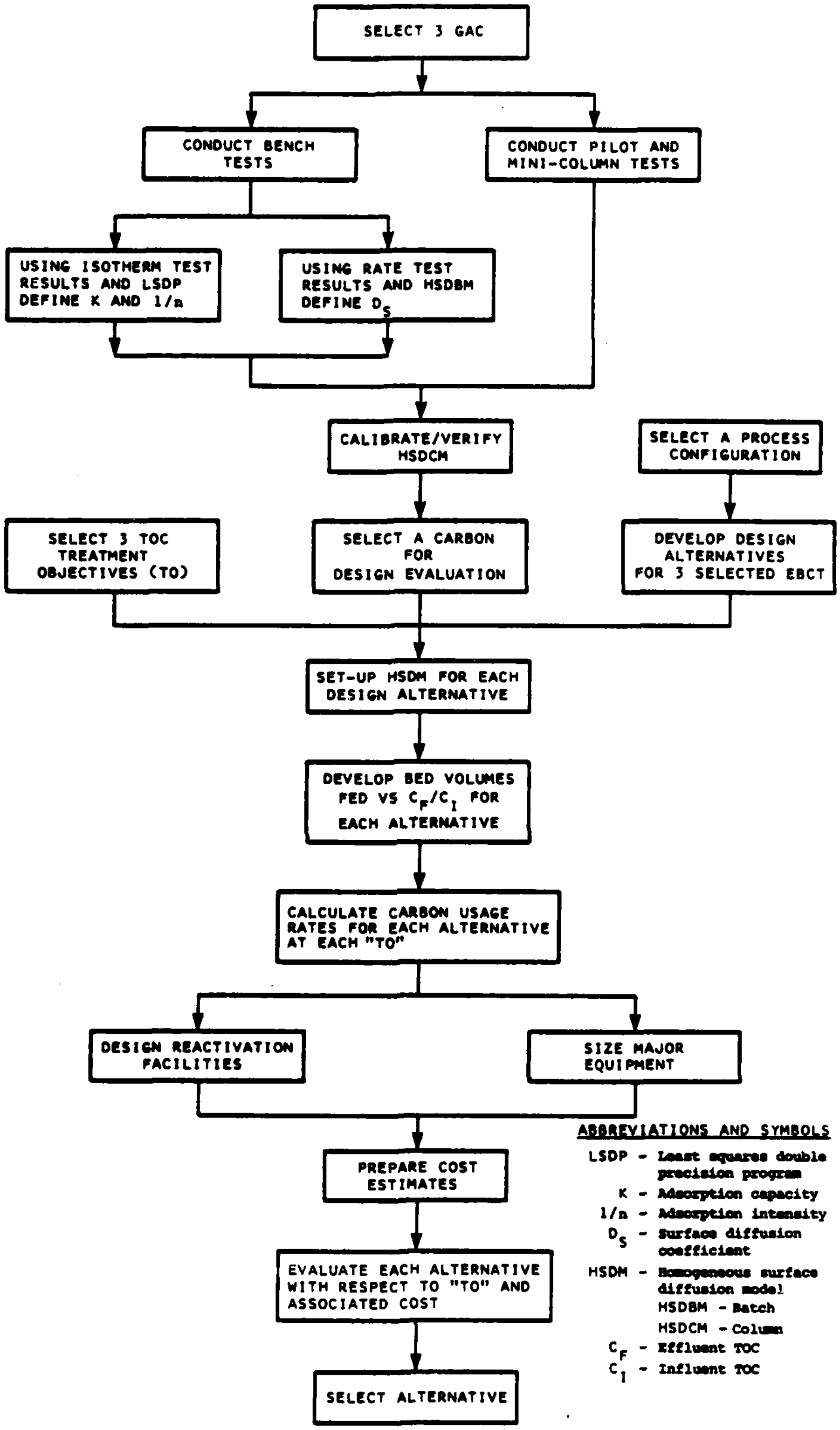
Selection of Three GACs

The number of carbons tested during this study was limited to three due to budgetary and time constraints. The three carbons evaluated in this study were chosen based on 1) the material from which they were produced, 2) mesh size, 3) extent of use in previous experimental work and 4) manufacturer. Each of these factors were considered simultaneously when comparing carbons.

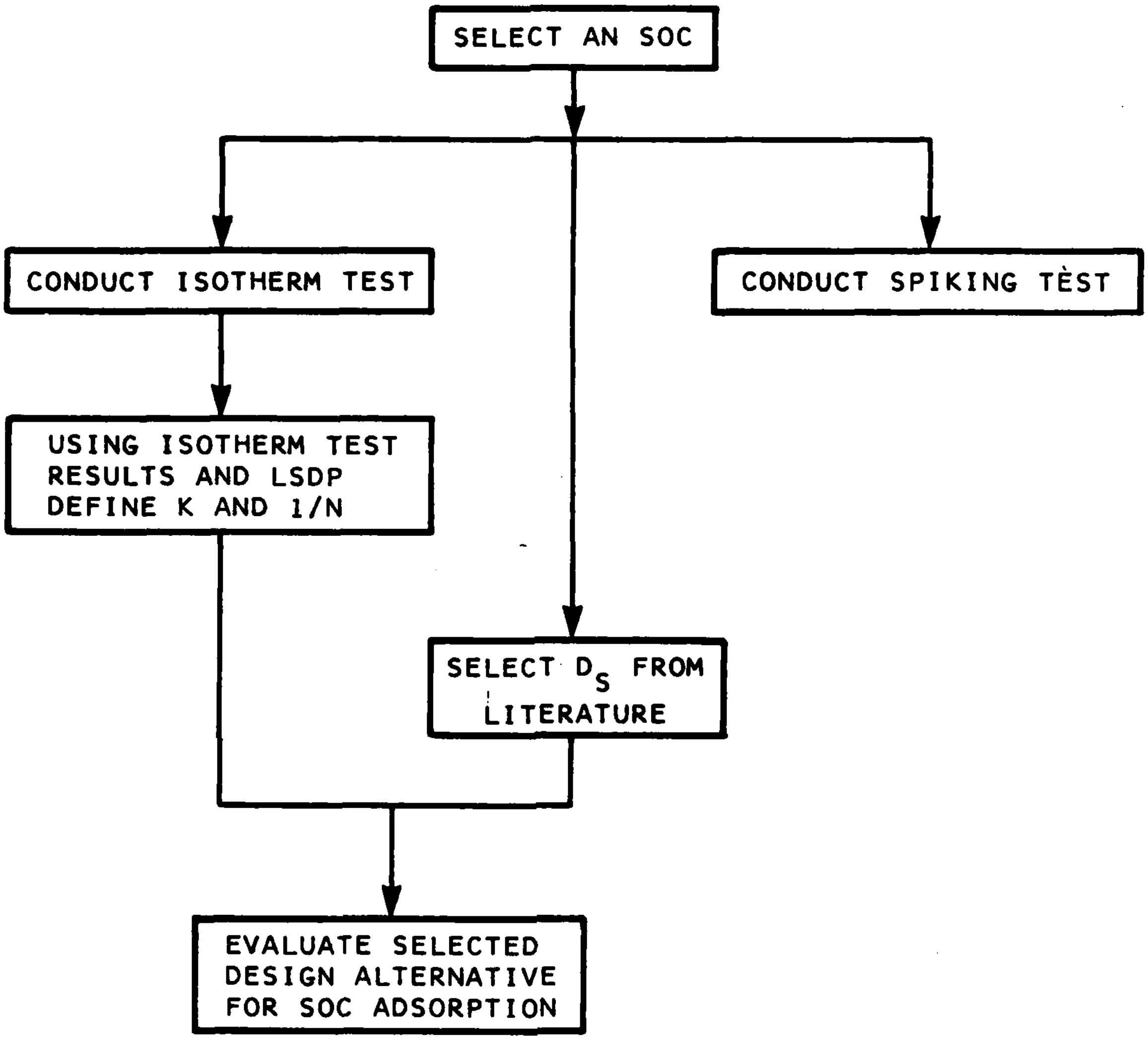
Bituminous and lignite coal are the two materials most frequently used for the production of granular activated carbon. Bituminous-based carbon is hard and dense, containing a larger number of pores in the smaller size ranges Lignite based carbon, on the other hand, is softer, not as dense and contains more larger sized pores.

Bituminous based GAC is usually favored for use in water treatment because of its hard, dense structure. A harder carbon has a lower attrition rate (loss and/or breakdown) during handling and a more dense carbon indicates a larger ratio of pounds of carbon per volume can be achieved. Therefore, more mass of carbon is available for the adsorption process and it potentially lasts longer between regenerations. Initial carbon and carbon regeneration costs are usually on a weight basis; however, savings are only truly realized in the form of capital cost of contactor and regeneration furnace.

However, because TOC is in general a larger molecule than most SOCs, it is possible that the distribution of pore sizes in the lignite based carbon is more favorable to TOC adsorption. A lignite based carbon, Hydrodarco 860,



TOC ADSORPTION
PROCESS ANALYSIS METHODOLOGY
FIGURE I. 3-1



SOC ADSORPTION EVALUATION PROCEDURE
FIGURE I. 3-2

was initially installed at the EEWTP. Because of the potential advantages associated with each carbon, it was decided that both bituminous and lignite based carbons would be tested. Two bituminous and one lignite based carbons were evaluated.

The three carbons evaluated in this study are ICI, Filtrasorb-400; Westvaco, WV-G; and Hydradarco, HD-4000. F-400 and WV-G are bituminous based and HD-4000 is a lignite based carbon, the replacement carbon for HD-860 which is no longer produced. All three carbons have consistent mesh sizes, 12 by 40, which help simplify the evaluation process. The three major GAC manufacturers are represented and, from each, one of the more widely used brands was selected. Each of the carbons has been evaluated in previous experimental work for the water industry.

Selection of SOC for Evaluation

The purpose of selecting a specific SOC for evaluation was two-fold. First, the SOC's adsorption parameters were to be used in the HSDM to aid in evaluating the adequacy of the optimum preliminary GAC design for SOC adsorption. Second, the removal of the selected SOC in a spiking study was utilized to evaluate the effects of a potential spill on the GAC process. The spiking study was conducted with pilot columns which were operated under similar conditions to the plant-scale columns and which were exhausted with respect to TOC. Several criteria were considered during the selection process.

1. Presence of the compound in EEWTP influent.

2. Known or suspected health effects, preferably a compound with a proposed MCL.

3. A highly adsorbable, competitive SOC is advantageous to the spiking study because desorption of other SOCs provides information pertaining to competition for adsorption sites.

4. The SOC should be somewhat desorbable, so that when the influent spike is removed, desorption into the effluent may occur.

The following seven SOCs were initially chosen for consideration because each one is a priority pollutant and has been assigned a proposed MCL range (Federal Register, 4 March 1981), except $CHCl_3$, which is a principal component of the regulated group, trihalomethanes.

SOC	Analysis	Potential MCL µg/L	EEWTP Influent[2] Min µg/L	Max µg/L	Median µg/L	Henry's Constant
CCl4	LLE	5-500	NQ	0.4	ND	1.2
CHCl3	LLE	20-100[1]	0.8	8.6	1.6	0.16
TCE	LLE	5-500	NQ	0.3	ND	0.48
PCE	LLE	5-500	NQ	4.4	0.6	1.1
1,1,1-Trichloroeth.	VOA	1,000	NQ	0.6	ND	0.17
1,2-Dichloroethane	VOA	1-100	ND	ND	ND	0.17
Vinyl Chloride	VOA	1-100	ND	ND	ND	301

1. A range based on THM composition in light of the total THM MCL of 100 µg/L.
2. Statistics on influent concentration data as of June 1982.

The last three SOCs were removed from final consideration. 1,1,1-Trichloroethane has a high proposed MCL and has not been found in a significant concentration in the EEWTP influent. 1,2-Dichloroethane and vinyl chloride were never detected in the EEWTP influent. Also, all three are analyzed by VOA which requires 250 ml samples, which the bench scale set-ups could not easily provide.

Pros and cons can be developed for each of the remaining four SOCs; however, after thorough consideration PCE was selected as the test SOC for the following reasons.

1. PCE is the most readily adsorbed of the four SOCs considered; therefore, preferential adsorption would potentially cause the other three to desorb during the spiking study. Competitive interactions for adsorption sites would be at a maximum providing for a conservative evaluation of potential column desorption during an SOC spill.

2. PCE was detected in the EEWTP influent at approximately one order of magnitude higher than CCl_4 and TCE, the next two most likely candidates.

METHODS

Bench and pilot-scale tests consisted of batch 7-day isotherm and 5-day rate studies, 24-hour mini-column (.025 gpm) tests and long-term pilot column (.22 gpm) studies which are discussed below.

<u>Bench-Scale</u>

<u>Isotherm.</u> There are two objectives associated with isotherm tests as follows:

1. To determine the Freundlich isotherm parameters; adsorption capacity, K, and adsorption intensity, 1/n.

2. To determine the mass of carbon which will produce a ratio of final solution concentration to initial concentration approximately equal to 0.5. This carbon dose was used in the rate study and helped to ensure that a well defined concentration/time profile was produced.

A general description of the isotherm test procedure can be found in Table I.3-7, at the back of this section. Experimental checks were conducted and evaluated prior to and during the isotherm experiments to ensure accuracy of the results. Below is a list of the preliminary concerns and the findings of the associated experimental checks.

1. Is TOC added to the solution concentration by addition of powdered GAC (PGAC) and GAC? No increase in TOC was measured.

2. Can the PGAC be sufficiently settled out of solution? Once the isotherm bottles have rotated for the predetermined contact time, the PGAC is settled out of the water column by centrifuging. An adquate centrifuge speed was found to be 2,200 rpm for a duration of ten minutes.

3. Is the TOC in solution, after contact time, settled out along with the PGAC when centrifuged? No settling of TOC was indicated from the samples analyzed.

4. Can TOC be adequately measured through UV absorption? Volume constraints associated with the rate study required that no more than 15 ml be removed for each sample, hindering the analysis of TOC directly. UV absorbance requires a smaller sample volume and can be analyzed immediately; therefore, a UV-TOC correlation was developed and UV was used as a surrogate for TOC in the rate study. The correlation coefficient for both pretreated waters is >0.90, indicating a good correlation. The correlations are depicted in Figure I.3-5.

5. Is the TOC fraction measured by UV absorbance preferentially adsorbed? Not all humic material measured as TOC absorbs UV light at the specified wavelength. Generally the aromatic compounds adsorb the UV light. By comparing UV-TOC correlations developed with filter effluent dilutions and isotherm supernatant, it was determined that the humic fraction which adsorbs UV light was not preferrentially adsorbed by the carbons.

6. Is equilibrium achieved during the contact time provided in the isotherm test? Tests were run up to fourteen days and no detectable TOC adsorption occurred after six full days. Therefore, the isotherm tests were run over the course of one week, start to finish.

Once the tests and analyses were completed, the results were inputted into a least square double precision (LSDP) computer program. The program fits a curve to the data utilizing the Freundlich isotherm equation which has been modified to account for a non-adsorbable fraction of TOC.

$$q_e = K\, C_e^{1/n} \quad (1)$$

where:

q_e = surface equilibrium capacity, mg/gm = $\frac{\text{(vol. of water)(Co - Ce)}}{\text{mass of PGAC}}$
K = adsorption capacity
1/n = adsorption intensity
$C_o = C'_o - C_x$
$C_e = C'_e - C_x$
C'_o = initial TOC concentration at time = 0, mg/L-C
C'_e = equilibrium TOC concentration, mg/L-C
C_x = non-adsorbable fraction of TOC, mg/L-C

Differential-Column Rate. The objective of this study is two-fold.

1. To experimentally determine C_e, the equilibrium liquid phase concentration, for the mass of carbon used in the column.

2. To provide concentration and time data for the calculation of the surface diffusion coefficient, D_s, by the HSDBM.

To achieve the objectives, the study was designed to eliminate the liquid-phase mass transfer resistance (LPMTR) for the TOC adsorption process. Adsorption of a compound from bulk solution involves liquid diffusion and diffusion within the carbon pores. The HSDM includes two primary components, liquid film transfer and surface diffusion within the micropores. The coefficients for film transfer and surface diffusion are k_f and D_s, respectively. To accurately determine either one of the coefficients, it is necessary to eliminate the effects of the other. Therefore, by eliminating the LPMTR, D_s can be correctly ascertained. In the differential column rate experiment, the LPMTR can be overcome by increasing the flowrate through the column until the difference in concentration of the compound tested at the influent and effluent to the column is immeasurable at a given point in time. Under this condition, surface diffusion is the only phase on the critical path and can be accurately determined by measuring the TOC adsorption which occurs in the recirculated solution over a long period of time (five days). The flowrate required to achieve equivalent TOC concentrations at the influent and effluent to the experimental column was 8.3 mg/sec for all but one test, in which 8.5 ml/sec was used.

A detailed description of the rate study experimental procedure is outlined in Table I.3-8. The procedure considers both TOC and LLE testing; however, the rate work in this study involved only TOC.

After the tests for each carbon were completed, the concentration and time data along with K, 1/n and C_x from the associated isotherm work were utilized as input to the HSDBM. Values for D_s and k_f were determined and a model curve describing the experimental rate data was produced. Based on the design of the experiment, D_s is the more sensitive and accurately determined coefficient.

Mini-Column. The isotherm and rate studies have the limitation of being conducted on sample water composited over a relatively short period of time (10

minutes to 24 hours). Pilot and plant-scale columns, on the other hand, run for several months and are subjected to variations in influent water quality. To determine if the results from bench-scale work were adequate to mathematically describe the adsorption taking place in the large columns, column work needed to be conducted with water from the same time frame as the corresponding isotherm and rate work. Therefore, mini-column tests were conducted to aid in the calibration/verification of the adsorption parameters.

Analysis of the mini-column data indicated that the test provided a more accurate means of determining the adsorption parameter, k_f, than did the previous rate work. Therefore, the objective of the mini-column work was to calibrate the k_f values previously determined from the bench work. K and 1/n were left unchanged as determined from isotherm work, and D_s was left as determined from the rate study work. k_f which was not accurately determined in the rate experiments, was adjusted as necessary to obtain a best fit of mini-column data, on the basis of least squares error. The full set of determined model parameters (K, 1/n, C_x, D_s and k_f) were subsequently tested against pilot-column data for verification and, if necessary, further calibration.

For a detailed outline of the experimental procedure see Table I.3-9 at the end of this section. Two important details of the experiment are worth noting. First, the mini-column experiments were conducted at the same loading rate as the pilot-column 4.5 gpm/ft^2. Second, the mini-columns ran for 24 hours, and column influent water was simultaneously composited in two, five gallon carboys for the 24-hour duration. The composited water was then used for corresponding isotherm and rate experiments.

Pilot-Column. The objectives of the pilot-column work are straightforward as expressed below.

1. To simulate the plant-scale GAC process and provide additional information for design.

2. To produce data which could be used to verify the adsorption parameters determined from bench-scale work, K, 1/n, C_x, D_s, k_f.

The pilot-column experiments conducted at the EEWTP fell into two categories, 1) simulation of the plant-scale process (15 min EBCT) and 2) long empty bed contact time study, LEBCT (30 and 60 min EBCT). The two experiments are similar, and are both described by the experimental procedure outlined in Table I.3-10 at the end of this section.

During the course of the GAC study two simulation runs were performed (one each during Phase I and Phase II) and a LEBCT experiment (Phase II). A special spiking study was conducted in Phase I and a discussion can be found under the Experimental Results section.

Modeling. The pilot-column influent data were used as input to the HSDCM computer porgram, along with the previously determined adsorption parameters of K, 1/n, D_s, k_f and C_x. For each carbon studied, the column effluent results

were plotted together with the modeled effluent simulation in order to verify the accuracy of the previously determined parameters.

Also, the pilot-column results, particularly the LEBCT, served as an additional check for the estimation of the non-adsorbed fraction.

Sensitivity analyses were conducted with K, 1/n and D_s to evaluate their influence on the computer generated "fits" for the rate, mini-column and pilot-column modeling results. The sensitivity analyses involved $\pm$50 percent variation in parameter values, one at a time. Utilizing the information obtained from these analyses, final variations in the parameter values were made when necessary. Discussion of the sensitivity analyses results is provided in the "Experimental Results" section.

DISCUSSION OF RESULTS

BENCH-SCALE RESULTS AND PARAMETER ESTIMATION

Isotherm Test

TOC, Alum/Polymer Pretreatment. The alum/polymer TOC isotherm work consisted of three tests per carbon conducted on a rotational basis over a 2.5 month time period, August through October 1982. Pretreated water came from a 1 gpm JMM pilot-plant consisting of rapid mix, flocculation, sedimentation and filtration. The chemical dosages used for the alum, polymer and chlorine additions were proportional to the full scale dosages used in Phase I.

Several tests for each carbon were conducted to satisfy the following three concerns.

1. It is difficult to characterize the equilibrium parameters for a carbon and a specific water source when the pretreated water being tested was collected over one duration of time.

2. Each complete set of the bench-scale tests, isotherm, rate and mini-column, for a specific carbon was not conducted on the "same" water but instead a several day lag occurred in between each of the three tests. Prior to each test a fifteen minute grab of the pretreated test water was collected. Combining data from two or more isotherm tests enhanced the likelihood of similar water qualities being used for each bench-scale test in a set.

3. Experimental error or problems discounted a specific test's results.

Results from the three isotherm tests for each carbon were entered into the LSDP program in varying combinations. The modified Freundlich isotherm equation which includes a non-adsorbed fraction of TOC is incorporated into the LSDP program, as discussed in the Methods section, to mathematically describe each combination of isotherm data.

The adsorption equilibrium parameters, K, 1/n and C_x are variables in the Freundlich equation which were calculated for each combination of data. Selection of the data combination and corresponding parameters which will be used to define the isotherm equilibrium adsorption for each carbon and pretreated water was based on a least squares calculation. This calculation indicates how well the isotherm curve defined by the parameters fits the data. Results of the LSDP defined isotherm curves are plotted in Figure 1.3-3(a), (b) and (c) for F-400, WV-G and HD-4000, respectively.

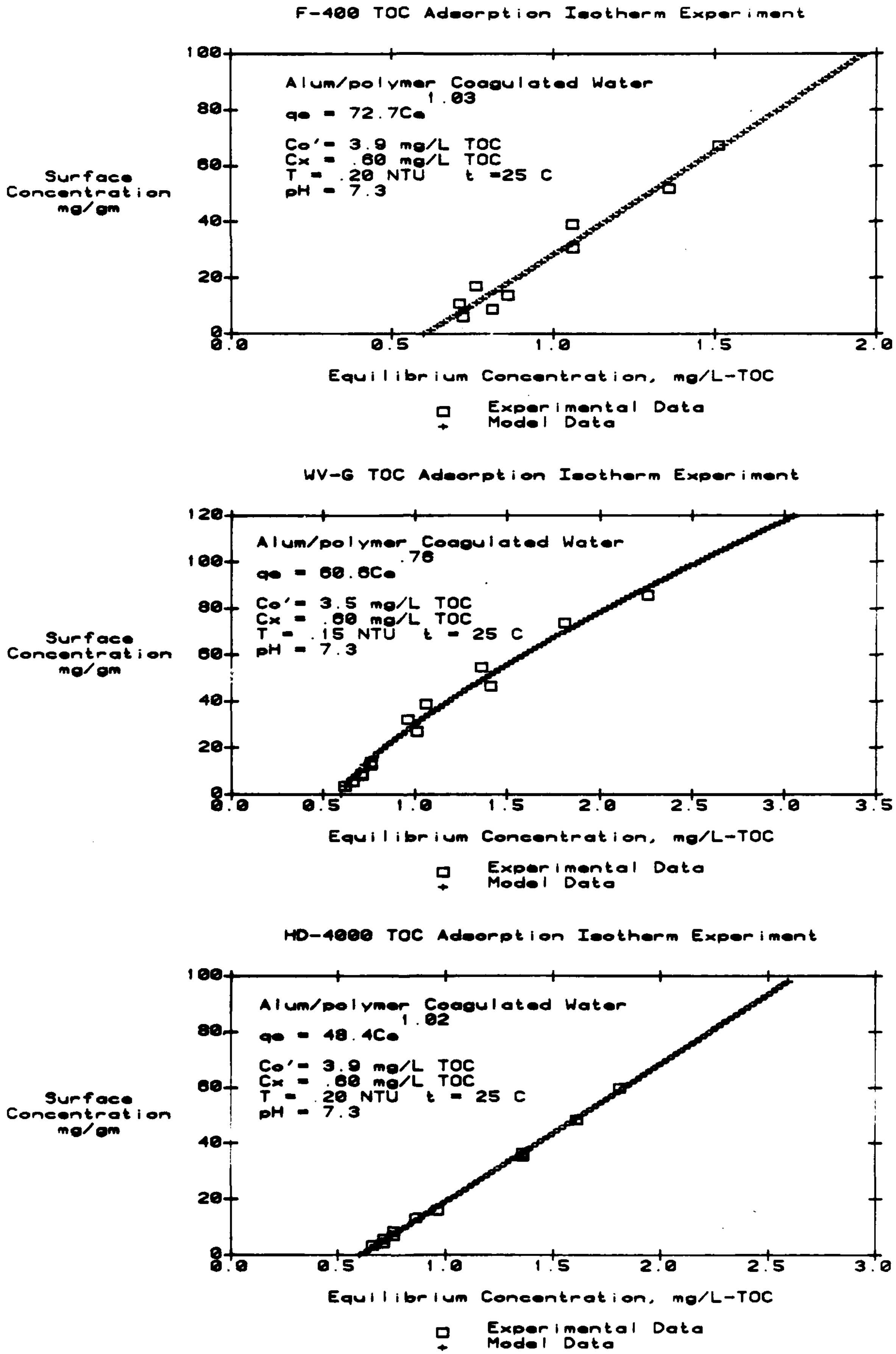
A summary of equilibrium adsorption parameters for each carbon are listed below.

Carbon	K	1/n	C_x mg/L-C
F-400	72.7	1.03	0.6
WV-G	60.6	0.76	0.6
HD-4000	48.4	1.02	0.6

The summarized values indicate that the non-adsorbed fraction of TOC associated with each carbon was a constant, 0.6 mg/L-C. 1/n, adsorption intensity, is an indicator of how readily a compound is adsorbed by a particular carbon. A 1/n value < 1.0 suggests favorable adsorption and 1/n > 1.0 implies unfavorable adsorption. The 1/n value associated with each of the carbons indicates that TOC is more readily adsorbed by WV-G followed by F-400 and HD-4000. K, adsorption capacity, is an indicator of the carbon's capacity for a specific compound; the higher the K value the more capacity available. A comparison of the K value for each carbon suggests F-400 has the greatest capacity for TOC followed by WV-G and then HD-4000.

Using the equilibrium parameters and an initial TOC concentration of 3.0 mg/L-C, q_e, the equilibrium surface concentration, can be calculated for each carbon. The calculations indicate that F-400 has the highest equilibrium capacity (225 mg/gm), HD-4000 is second (148 mg/gm), and WV-G (140 mg/gm) last. The characteristics of each carbon, defined by the adsorption parameters are preliminary and results from the complete GAC study, presented later, provide more substantial information pertaining to the performance of each carbon.

<u>TOC, Lime Pretreatment</u>. The TOC isotherm work conducted with the lime pretreated water also consisted of three tests per carbon on a rotational basis, October to December 1982. Several tests were conducted for each carbon to satisfy some of the concerns outlined in the alum/polymer pretreatment discussion above. The test water did not come from the JMM pilot-plant but instead came from the plant-scale gravity filter clearwell. The test water was composited over a 24-hour duration for both the isotherm and differential



TOC ADSORPTION ISOTHERMS
PHASE I
FIGURE I. 3-3

column rate tests at the same time the mini-column test was conducted. Therefore, each set of bench-scale tests, isotherm, rate and mini-column, were conducted on the "same" water.

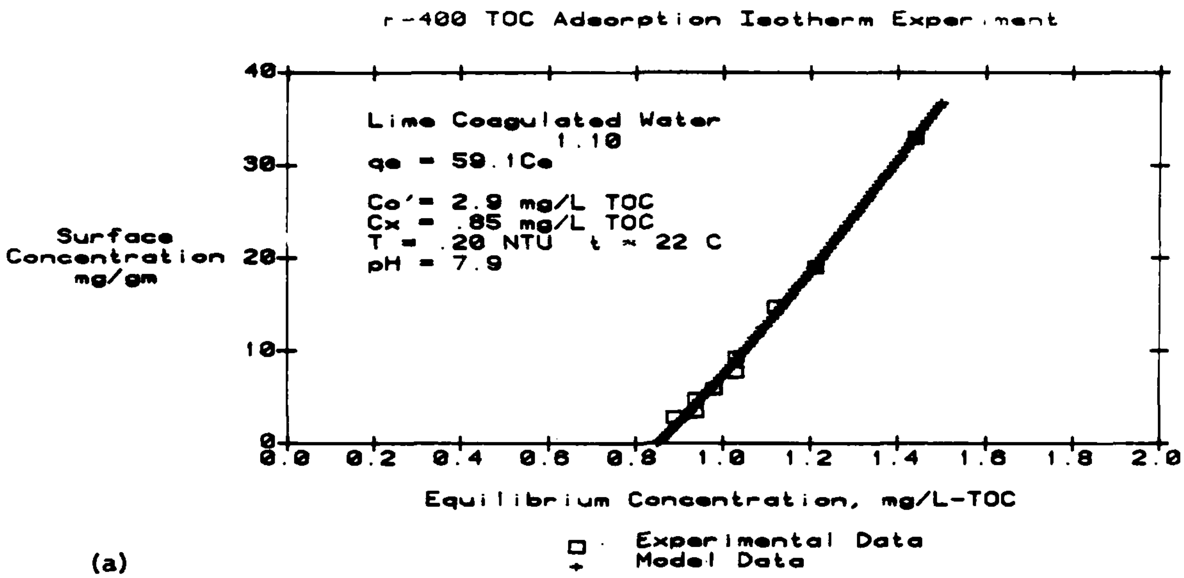
Experimentation with plant-scale lime doses was conducted simultaneously with the lime bench-scale tests such that the tests were conducted on influent waters of varying pH. Because a lime dose which produced a pH = 10.5 during sedimentation was selected for plant-scale use, data from the isotherm tests conducted with water from this pretreatment stage were used in the LSDP program. The TOC isotherm curve defined for each carbon is depicted in Figure I.3-4. The curves and their associated adsorption equilibrium parameters were selected as described in the alum/polymer pretreatment discussion. A summary of the selected parameters is listed below:

Carbon	K	1/n	C_x mg/L-C
F-400	59.1	1.10	0.85
WV-G	55.0	1.12	0.90
HD-4000	45.4	1.12	0.90

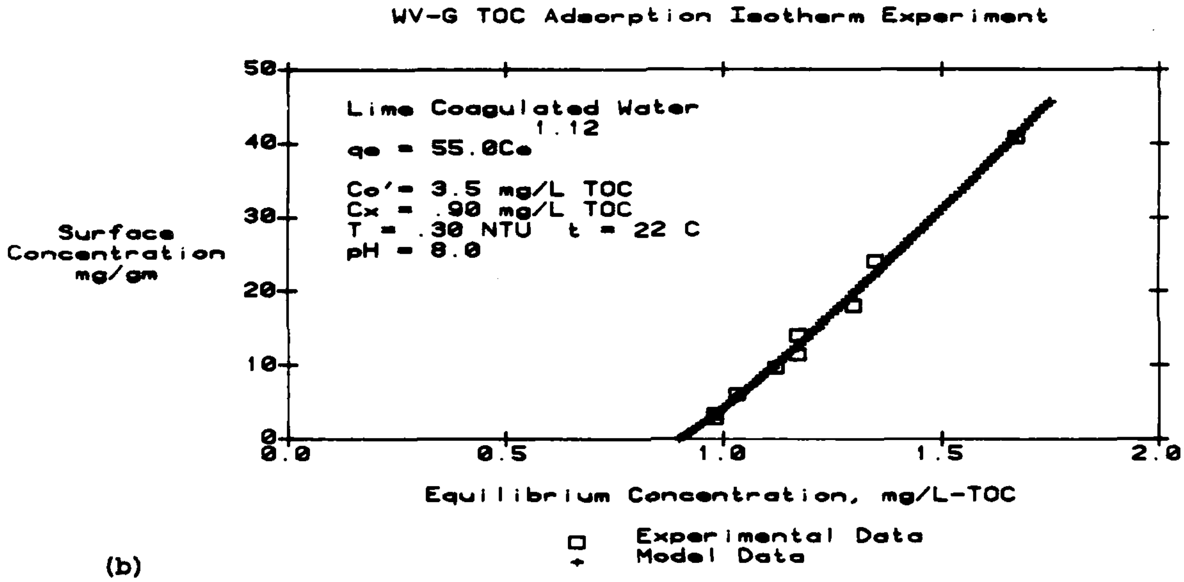
The non-adsorbed fraction of TOC corresponding to each carbon is higher than the values determined for alum/polymer pretreated water; however, the vlaues are still consistant between the carbons. 1/n values suggest that all three carbons adsorb TOC equally well. A comparison of the K values implies that F-400 has the greatest capacity for TOC adsorption followed by WV-G and then HD-4000 during lime pretreatment. Calculated q_e values, based on the isotherm equilibrium parameters and an influent TOC = 3.2 mg/L-C, reiterate the implications derived from the K values. F-400 has the highest equilibrium capacity for TOC (212 mg/gm), followed by WV-G (202 mg/gm) and last HD-400 (167 mg/gm).

<u>TOC, Alum and Lime Pretreatment Compared.</u> The 1/n values for TOC adsorption are all approximately equal to 1.0 except for the alum/polymer, WV-G value. A value of 1.0 for 1/n is supported by experimental work with commercial humic acid conducted by Lee (1980). In addition, Cannon and Roberts (1982), conducted adsorption experiments with DOC from treated wastewater and found 1/n = 1.0 also. Pirbazari (1980) tested humic acid and found 1/n values to be 0.1 to 0.2 less than the values associated with the alum/polymer, WV-G work. Therefore, the values for 1/n defined by the EEWTP isotherm work are in agreement with the documented results from work produced by those mentioned above.

K values for TOC adsorption at the EEWTP are four to seven times higher than the value documented in the Roberts and Summers (1982) article. Data from water treatment plants with GAC in the U.S. and Europe were used to develop an equilibrium adsorption capacity correlation in the article. Results from Lee (1980) are in agreement with the Roberts and Summers (1982) article.



(a)



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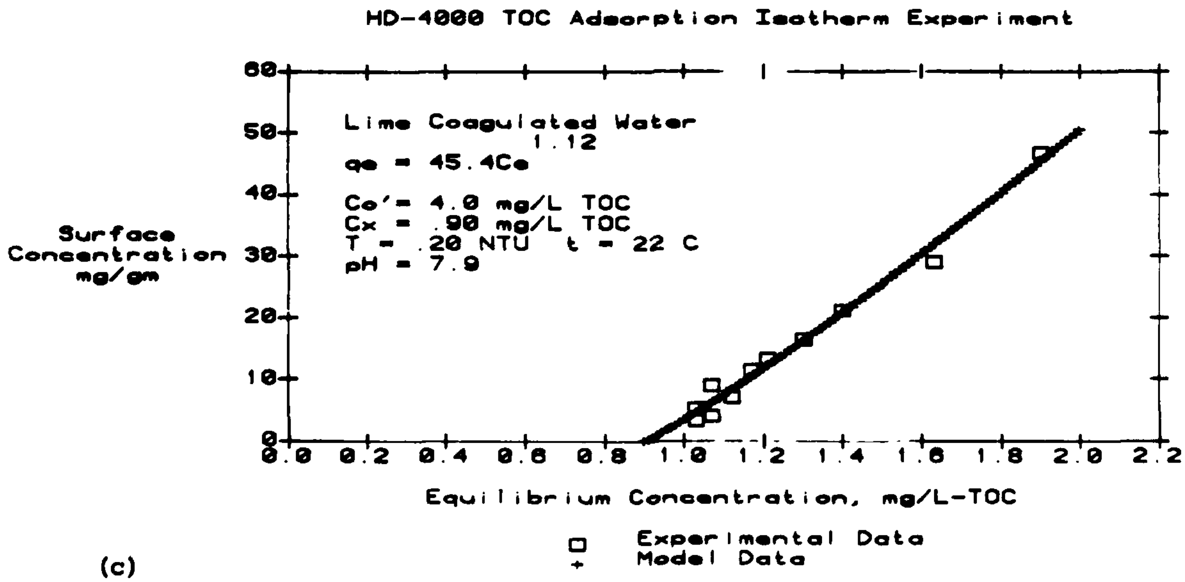


(c)

TOC ADSORPTION ISOTHERMS
PHASE II
FIGURE I. 3-4

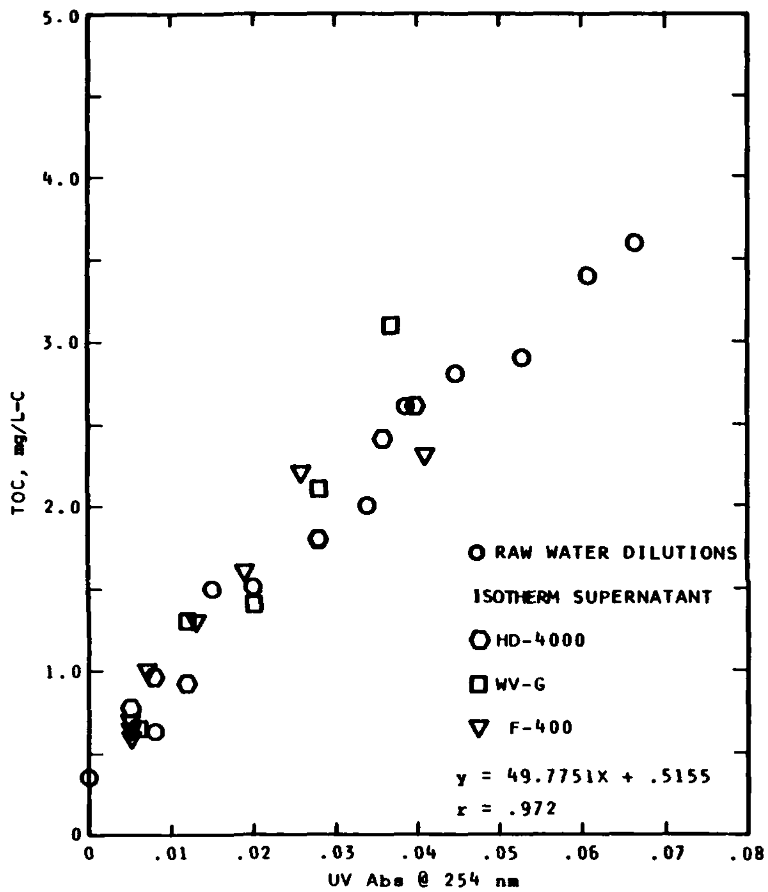
q_e values associated with a particular Ce, such as 2.0 mg/L-C, for the EEWTP bench rate work (98 to 148 mg/gm) are approximately five to ten times higher than the value at this Ce (q_e = 16 mg/gm) documented by Roberts and Summers (1982). Experimental work conducted by Glaze (1981) produced a q_e = 70 mg/gm for C_e = 2.0 mg/L-C which is still 0.5 to 2 times lower than the EEWTP values. The q_e values for the work discussed above suggest that the carbons being tested at the EEWTP have high equilibrium capacities for TOC as compared to other sources.

UV-TOC Correlation. Volume constraints associated with the rate study apparatus disallowed the direct use of TOC. As discussed in the Methods section, UV-TOC correlations were developed for each pretreated water. Each correlation incorporates both raw water dilutions and isotherm supernatant samples from each carbon tested. The correlations allow UV at 254 nm to be used as a surrogate parameter for TOC in the differential column rate work. Using the isotherm supernatant samples provided good continuity between the bench-scale isotherm and rate work.

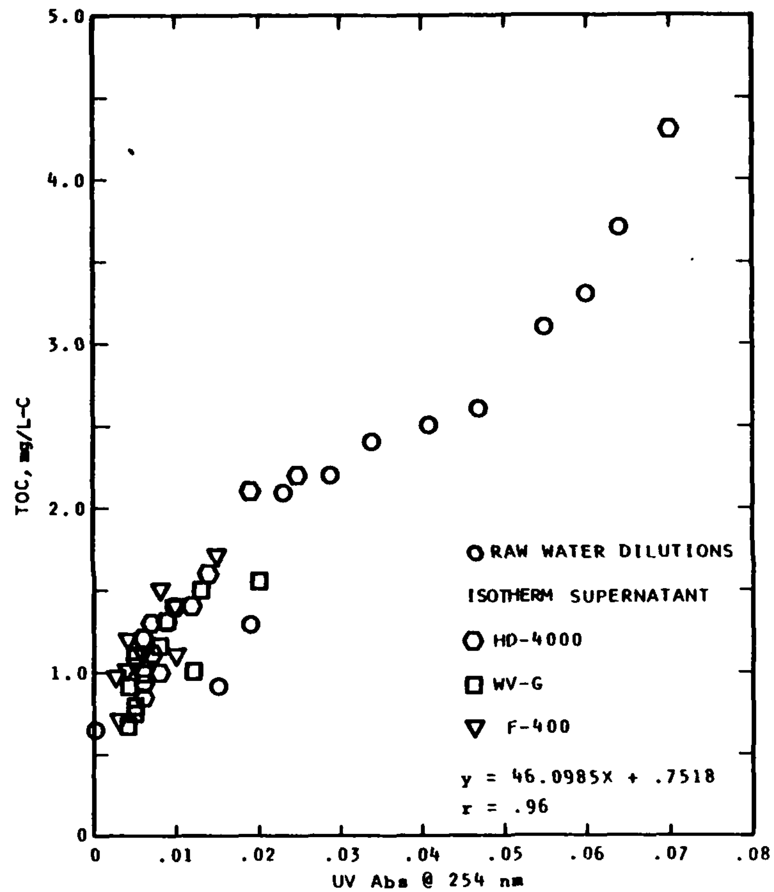
Figure I.3-5(a) and (b) are the correlations for the alum/polymer and lime pretreated waters, respectively. The 'r' value associated with each UV-TOC correlation indicates how well the correlation fits the data, 1.0 being a perfect fit. The value of 'r' for each correlation is greater than 0.9 indicating good fits.

PCE, Alum/Polymer Pretreatment. The PCE isotherms were conducted according to the isotherm test procedure in the Methods section and the test water collected was as described in the alum/polymer, TOC results section above. Stock spiking solution was prepared at a concentration within 5 mg/L of the solubility limit, 150 mg/L-PCE. The PCE concentration in the spiked test waters ranged from 2.5 to 6.5 mg/L-PCE. All three carbons were tested simultaneously, using the same spiked waters.

Data from the isotherm test with a spiked concentration of 6.2 mg/L-PCE were used in the LSDP to determine the values of the equilibrium isotherm parameters. This data set was selected because the spiked concentration would allow a broad range of concentrations to be depicted by the isotherm equilibrium curve, including the 1.5 mg/L-PCE influent spike concentration of the spiking study (see Pilot-Column Results section). A summary of the equilibrium parameters is tabulated below in Table I.3-1.



PHASE I



PHASE II

GAC STUDY
UV–TOC CORRELATION
FIGURE I. 3–5

TABLE I.3-1

PCE EQUILIBRIUM ADSORPTION PARAMETERS
ALUM/POLYMER PRETREATED WATER

Carbon	K	1/n	C_x
F-400	713.4	0.48	0
WV-G	784.6	0.62	0
HD-4000	465.6	0.48	0

The isotherm curves depicted in Figure I.3-6 and defined by the parameters in Table I.3-1 indicate that, unlike the TOC isotherms, a non-adsorbable fraction of PCE is non-existant. WV-G, according to the values for 1/n, adsorbs PCE most readily followed equally by F-400 and HD-4000. A comparison of the K values suggests that WV-G has the greatest capacity for PCE adsorption, F-400 second and HD-4000 last. Calculated values of q_e, using the isotherm parameters in Table I.3-1 and a C_e = 1.5 mg/L-PCE, also indicate that WV-G has the highest equilibrium surface capacity for PCE (1,009 mg/gm) followed by F-400 (867 mg/gm) and last by HD-4000 (566 mg/gm). The PCE isotherm results for one carbon were used to evaluate the preliminary GAC process design for SOC removal. A discussion of this work can be found in the Application to Design section.

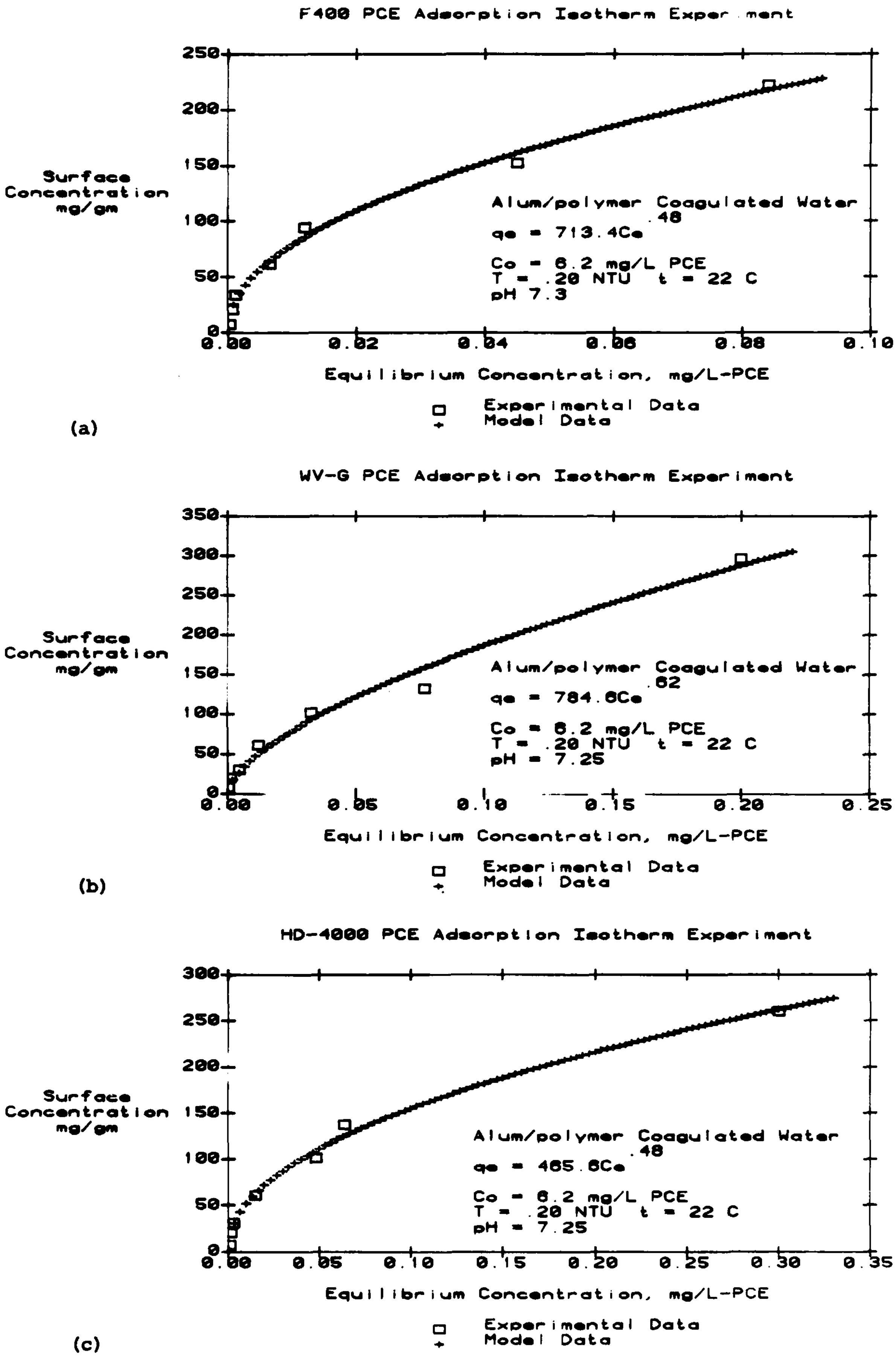
Differential Column Rate Test

TOC, Alum/Polymer and Lime Pretreatment. Three tests per carbon per pretreatment were conducted during the same time frames as the corresponding isotherm work. The test water used for each pretreatment tested is described in the Isotherm Results section. A detailed description of the experimental procedure for the rate test is outlined in the Methods section.

For each carbon and pretreatment mode one set of differential column batch rate test results was selected out of the three tests conducted per carbon and pretreatment as input for the HSDBM. Selection of the rate test and corresponding data was based on the following points of consideration.

1. For the alum/polymer pretreated water, the data from a combination of isotherm tests were used in the LSDP work to define the equilibrium parameters for each carbon. The rate test which was conducted at approximately the same time as the combination of isotherm tests was chosen and the related data used in the HSDBM.

2. For the lime pretreated water, 10 gal. of test water were composited over a 24-hour duration and one isotherm and rate test were conducted for one carbon with the composited water. Therefore, the isotherm and rate test data used in the LSDP and HSDBM work, respectively, for each carbon, were chosen from the tests conducted with the "same" water.



PCE ADSORPTION ISOTHERMS
PHASE I
FIGURE I. 3-6

3. **Resulting experimental data were well distributed, producing a time versus C_f curve which is adequately defined by the predicted curve produced by the HSDBM work.**

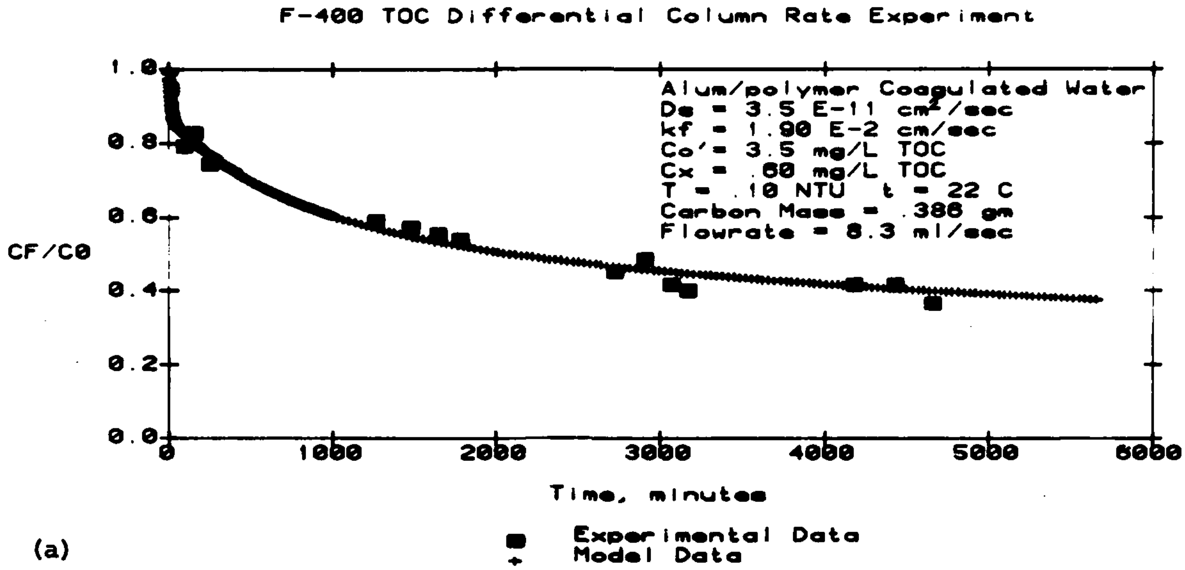
The results of the TOC rate tests and modeling work are depicted in Figures I.3-7 and I.3-8 for the alum/polymer and lime pretreated waters, respectively. A summary of the adsorption parameters defined by the model data is tabulated below.

Carbon	K	1/n	D_s cm^2/sec	k_f cm/sec	C_x mg/L
F-400					
alum/polymer	72.7	1.03	3.5E-11	1.9E-2	0.6
lime	59.1	1.10	1.1E-10	2.35E-3	0.85
WV-G					
alum/polymer	60.6	0.76	4.9E-10	1.05E-2	0.6
lime	55.0	1.12	4.7E-10	2.8E-3	0.9
HD-4000					
alum/polymer	48.4	1.02	2.8E-10	1.45E-3	0.6
lime	45.4	1.12	1.0E-10	1.45E-3	0.9

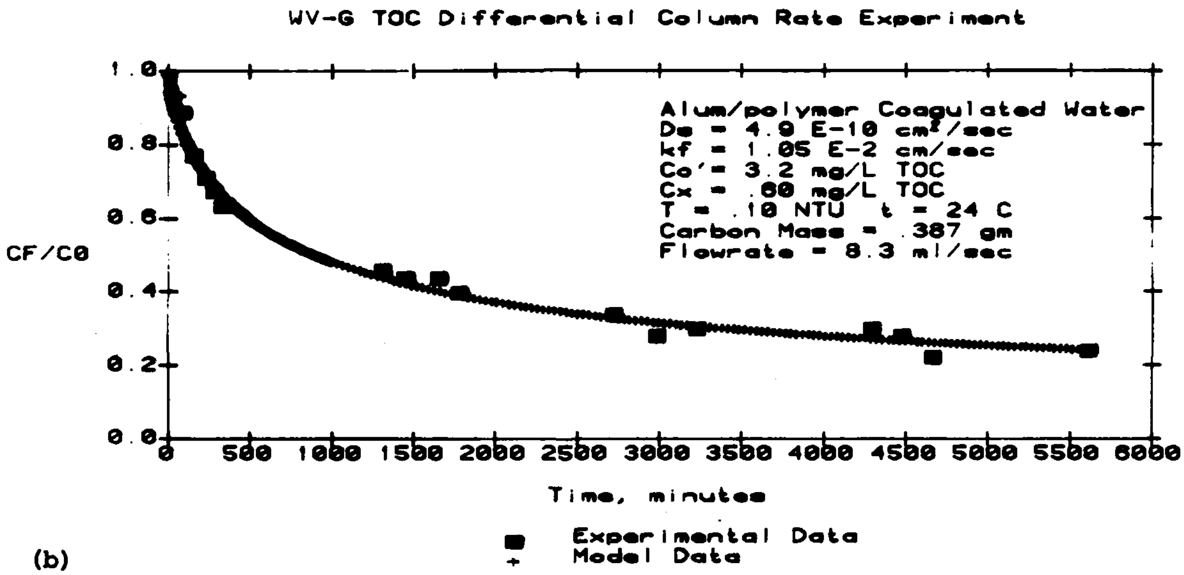
The equilibrium parameters defined by the isotherm work were not varied during the HSDBM work. Only the initial values defined for D_s by the HSDBM were varied to produce a model curve which adequately defines the experimental data. As discussed in the Methods section, the differential column rate tests were conducted to accurately determine the D_s value corresponding to each carbon. The experiment was not designed to determine k_f values; therefore, the modeling results should be more dependent on the values defined for D_s than k_f. To check this concept, sensitivity analyses were conducted for D_s and k_f with one complete set of the differential column rate results.

Figures I.3-9 and I.3-10 are the sensitivity analyses for D_s and k_f, respectively using the alum/polymer, pretreated water, adsorption parameters. The figures indicate that D_s is the more sensitive parameter and, therefore, varying D_s, to insure a 'good' model fit of the experimental data, was warranted. Selection of the D_s value was based on a least squares error calculation involving the model and experimental data sets.

Pribazari (1980) and Lee (1980) conducted GAC bench and pilot work with humic acids and both modeled the results with models which incorporated the film transfer, k_f, and surface diffusion coefficients, Lee used the HSDM. Commercial humic acid was used in both programs and the same carbons were tested as well as others. Pirbazari prepared humic acid stock solutions with both tap and distilled-deionized water. While the same carbons were used, different mesh size ranges were tested. Pirbazari used mesh sizes from 16 to 40 and Lee used a



(a)



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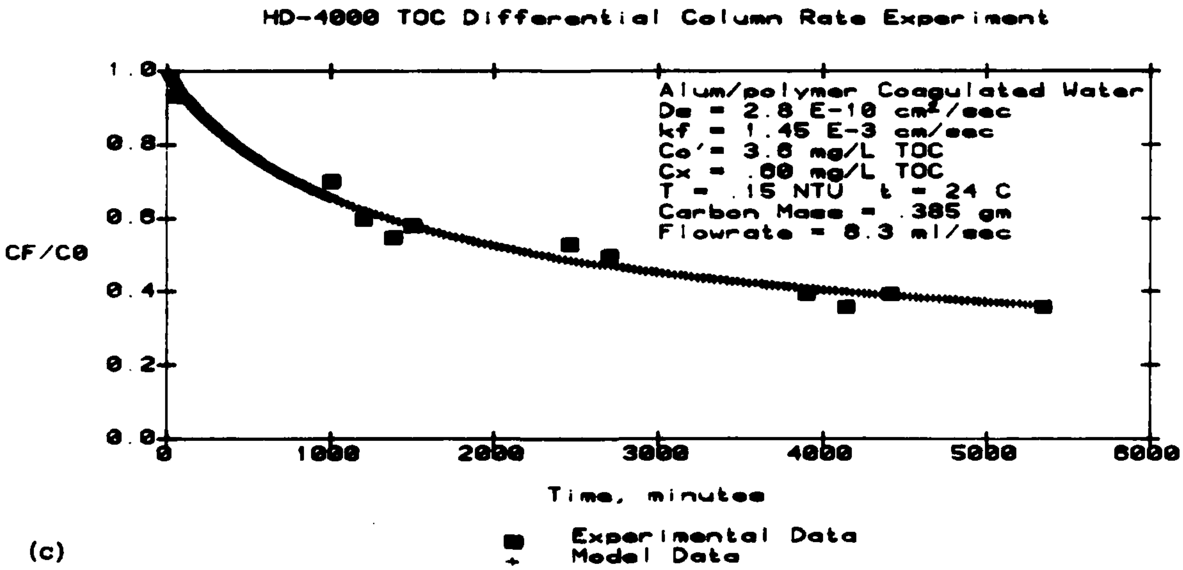
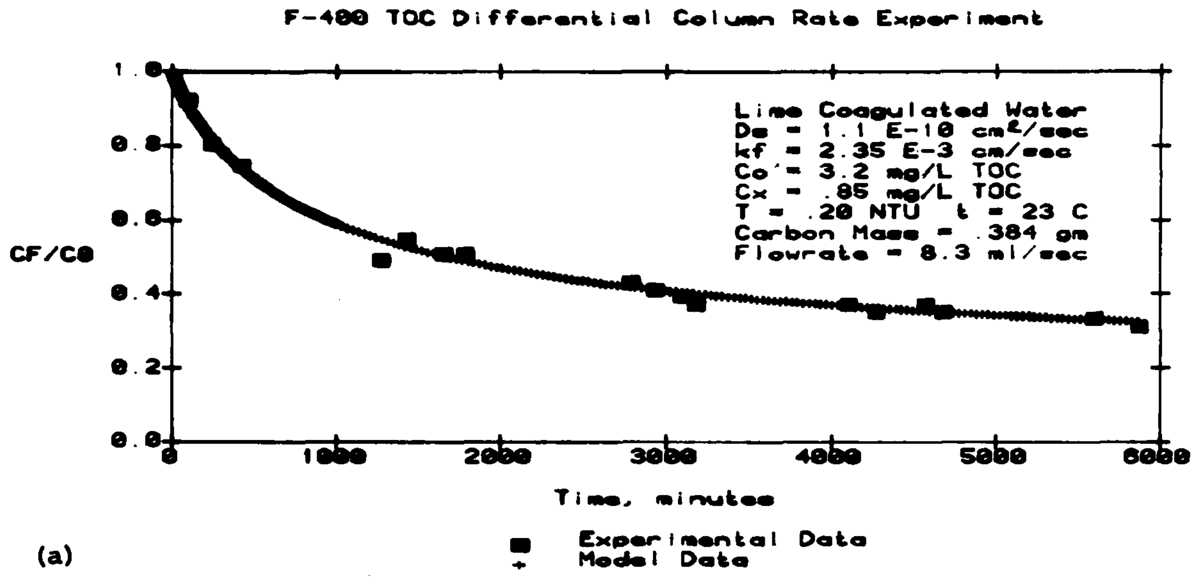


(c)

DIFFERENTIAL COLUMN RATE EXPERIMENTS
(PHASE I)
FIGURE I. 3-7



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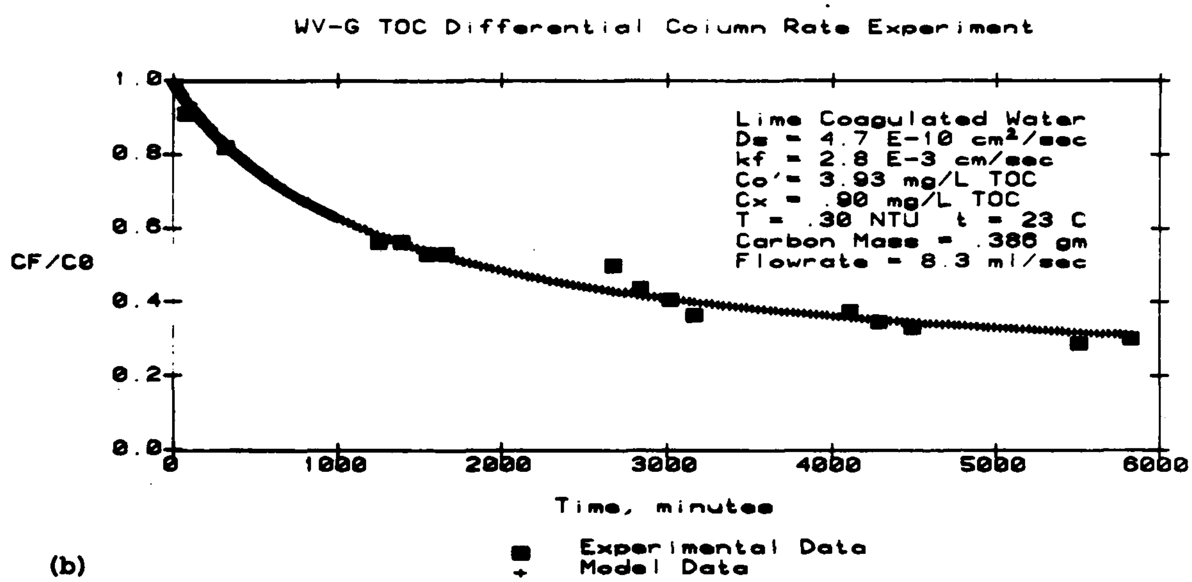
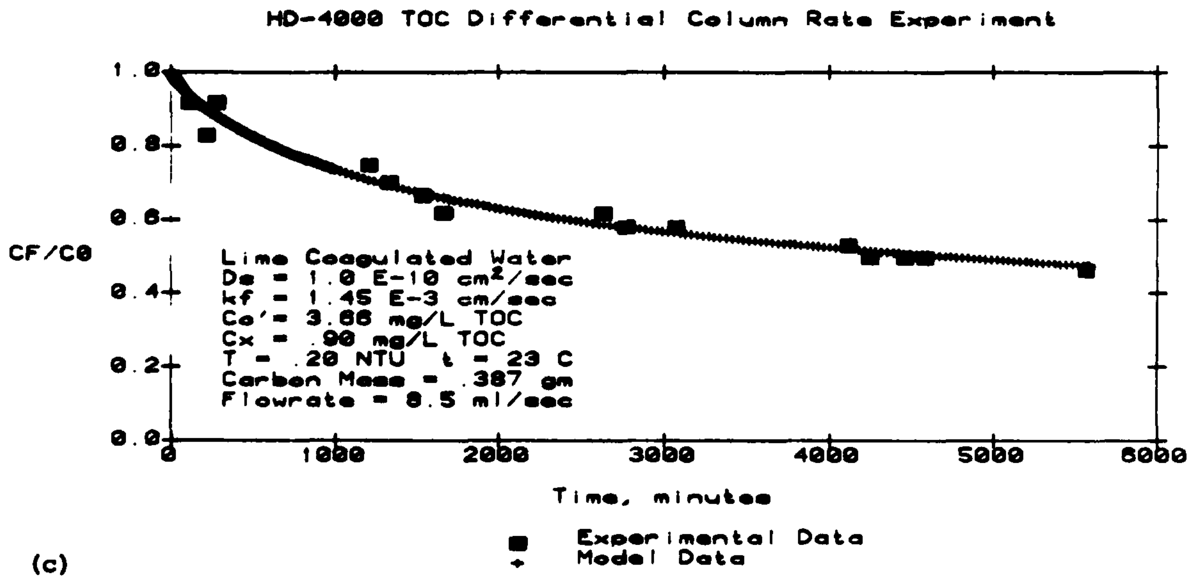
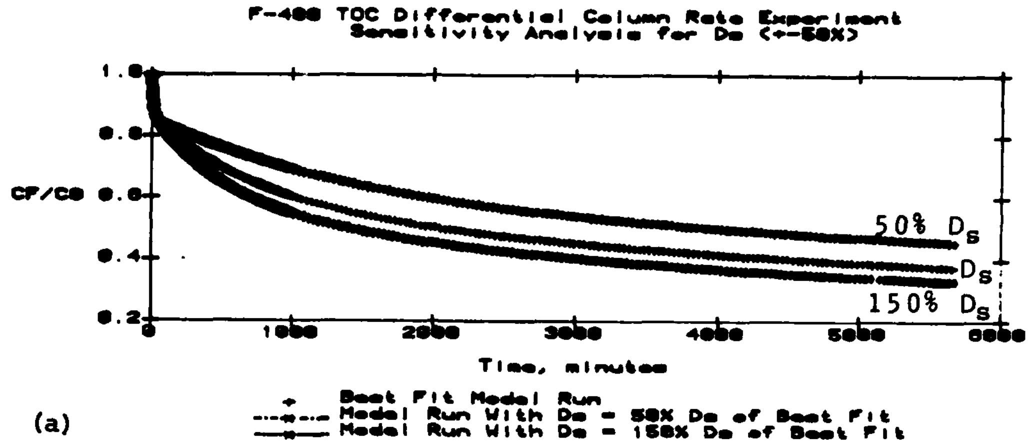


(b)

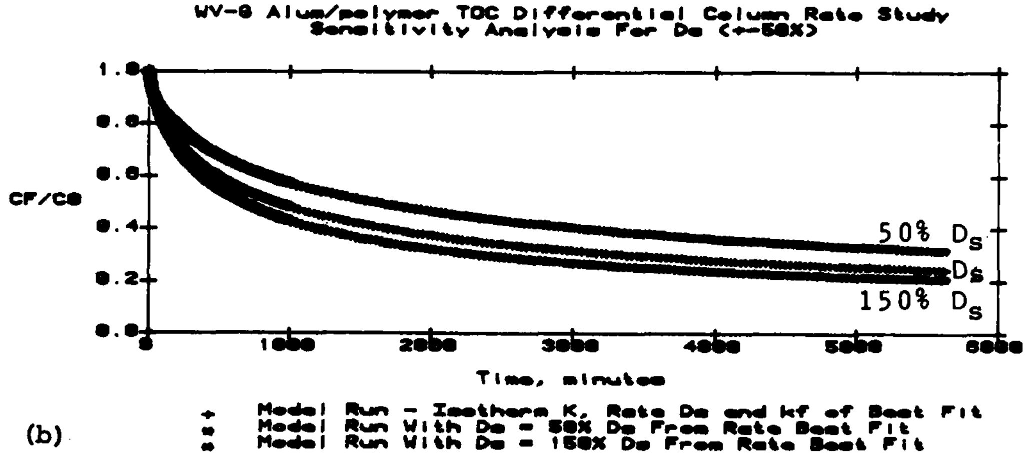


(c)

DIFFERENTIAL COLUMN RATE EXPERIMENTS
(PHASE II)
FIGURE I. 3-8



(a)



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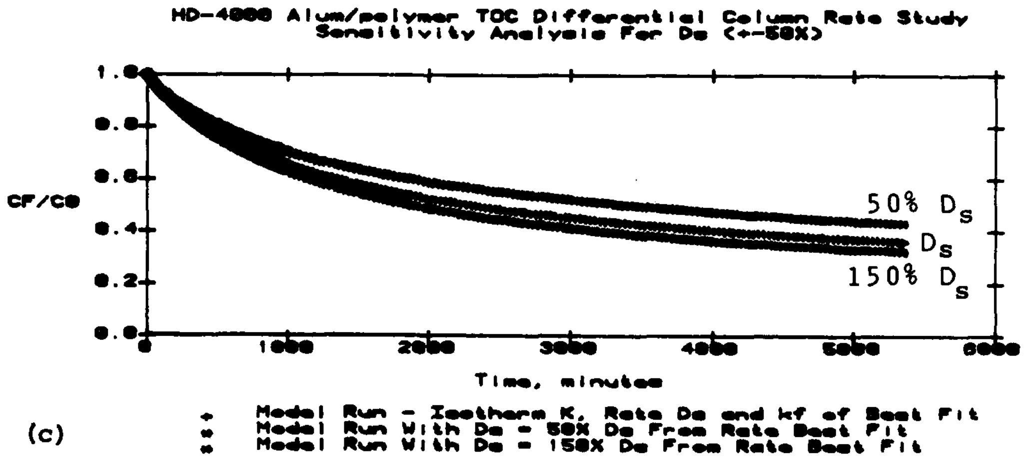
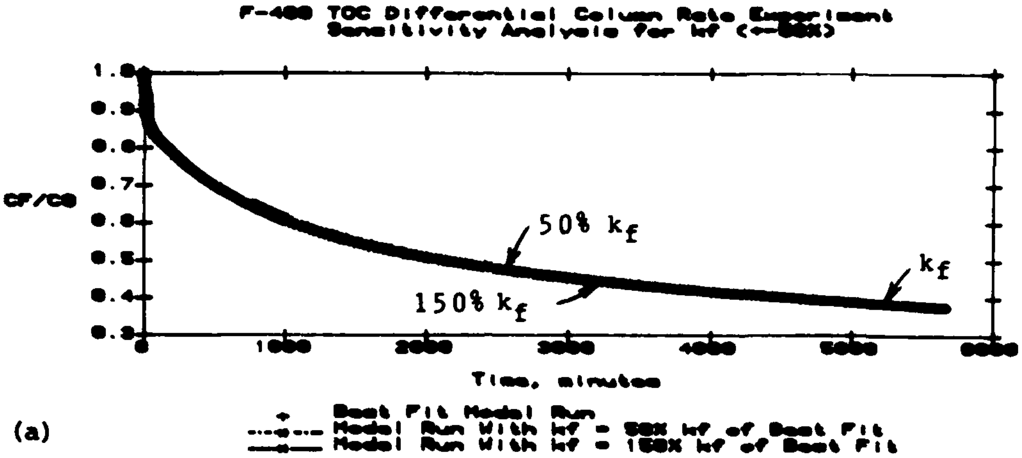
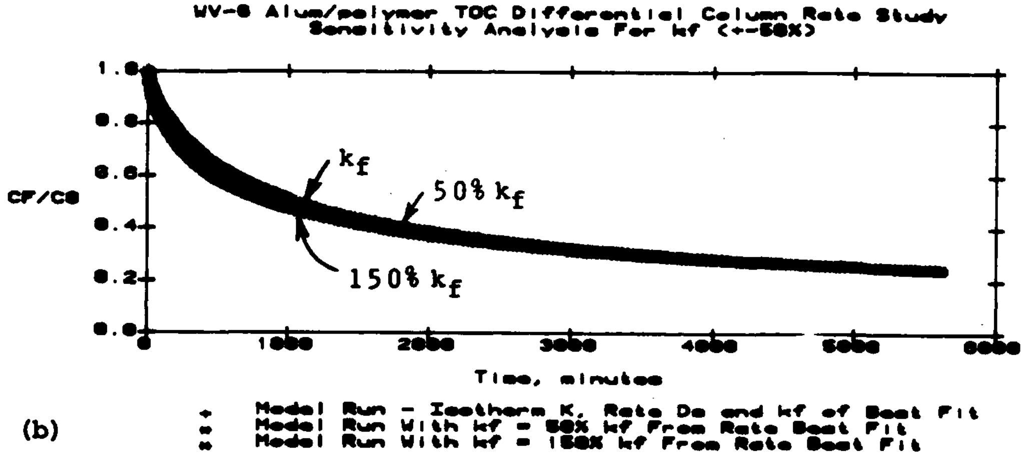


(c)

SENSITIVITY ANALYSES FOR D_S
DIFFERENTIAL COLUMN RATE TEST
FIGURE I. 3-9



(a)



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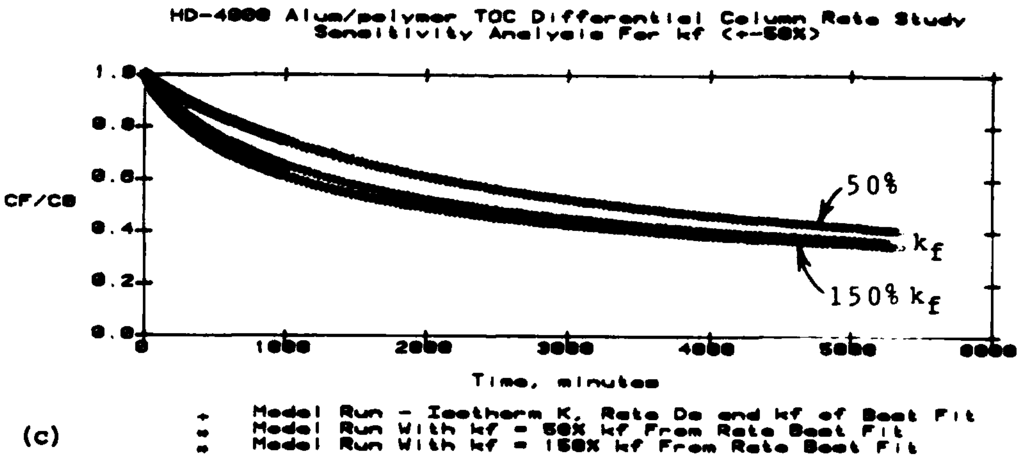


(c)

SENSITIVITY ANALYSES FOR k_f
DIFFERENTIAL COLUMN RATE TEST
FIGURE I. 3-10

smaller size of 20 x 40 mesh carbon. The mesh size used at the EEWTP was 12 x 40, similar to the range tested by Pirbazari.

The D_s values documented by Pirbazari (1980) are in agreement with the values tabulated above. Lee (1980), however, documents values one order of magnitude higher. The difference between recorded values is probably due, in large part, to the carbon mesh size tested. The carbon Lee used has a higher percentage of micropores which produces a slower adsorption rate.

Mini-Column Results

As with all the bench-scale tests, at least three tests were conducted for each carbon with each pretreated water. The test water used for the mini-column runs came from the pilot-scale filter clearwell and from the plant-scale filter clearwell for the alum/polymer and lime pretreated waters, respectively. More discussion on the water used can be found in the Isotherm Test results section. The loading rate used for the mini-column run was equivalent to the GAC pilot-columns, 4.5 gpm/ft^2. The mini-column runs were conducted over a 24-hour duration and treated 2,200 to 2,600 bed volumes, BV, of pretreated water.

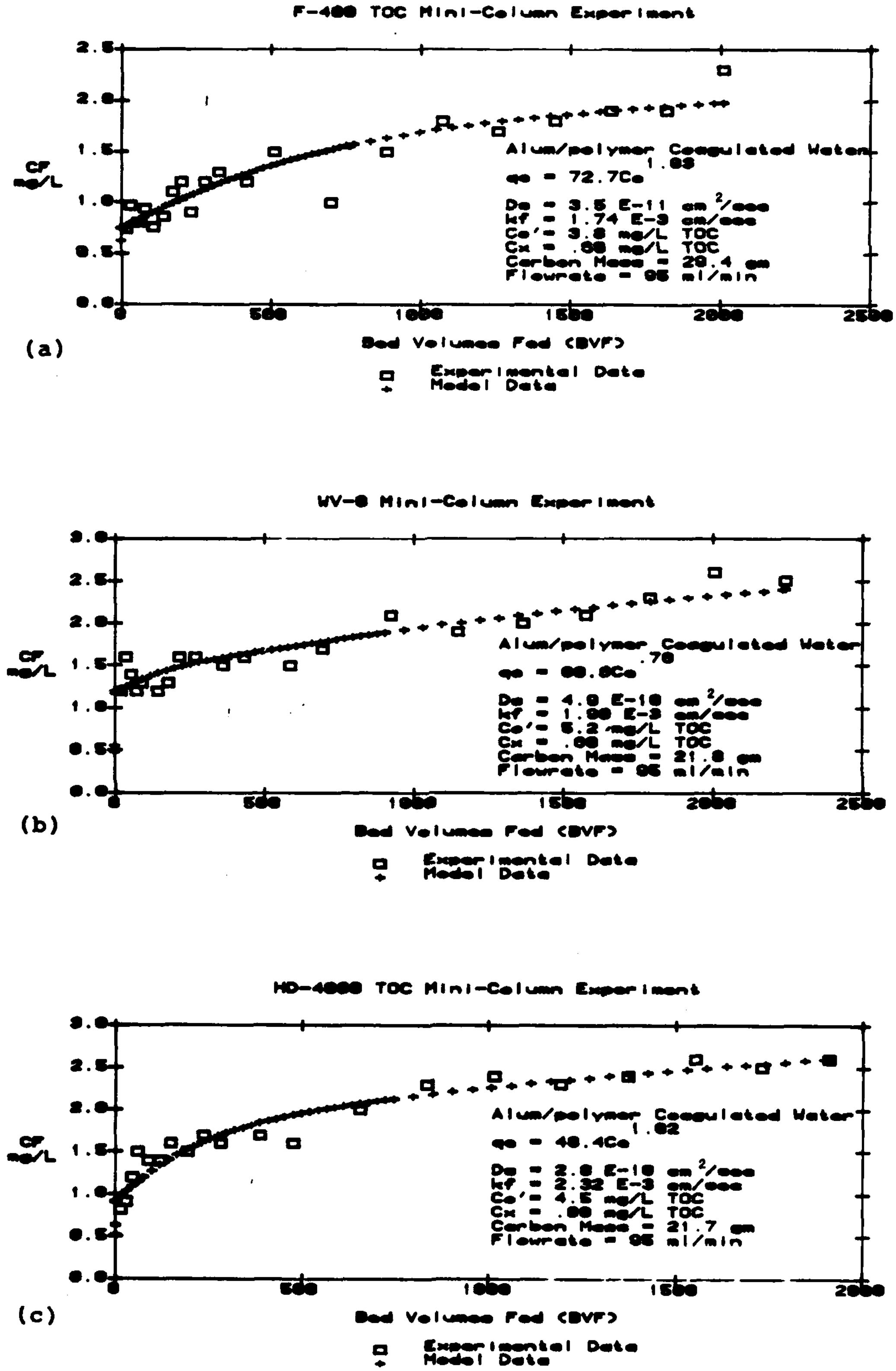
The representative mini-column test and corresponding data to be used in the HSDCM for each carbon and pretreatment mode was chosen from the three tests conducted for each carbon and pretreatment. Selection of the mini-column test was based on the following three points.

1. For the alum/polymer pretreated water, the set of data from the mini-column test conducted at approximately the same time as the isotherm and rate tests used in the LSDP and HSDBM work, was chosen for the HSDCM work.

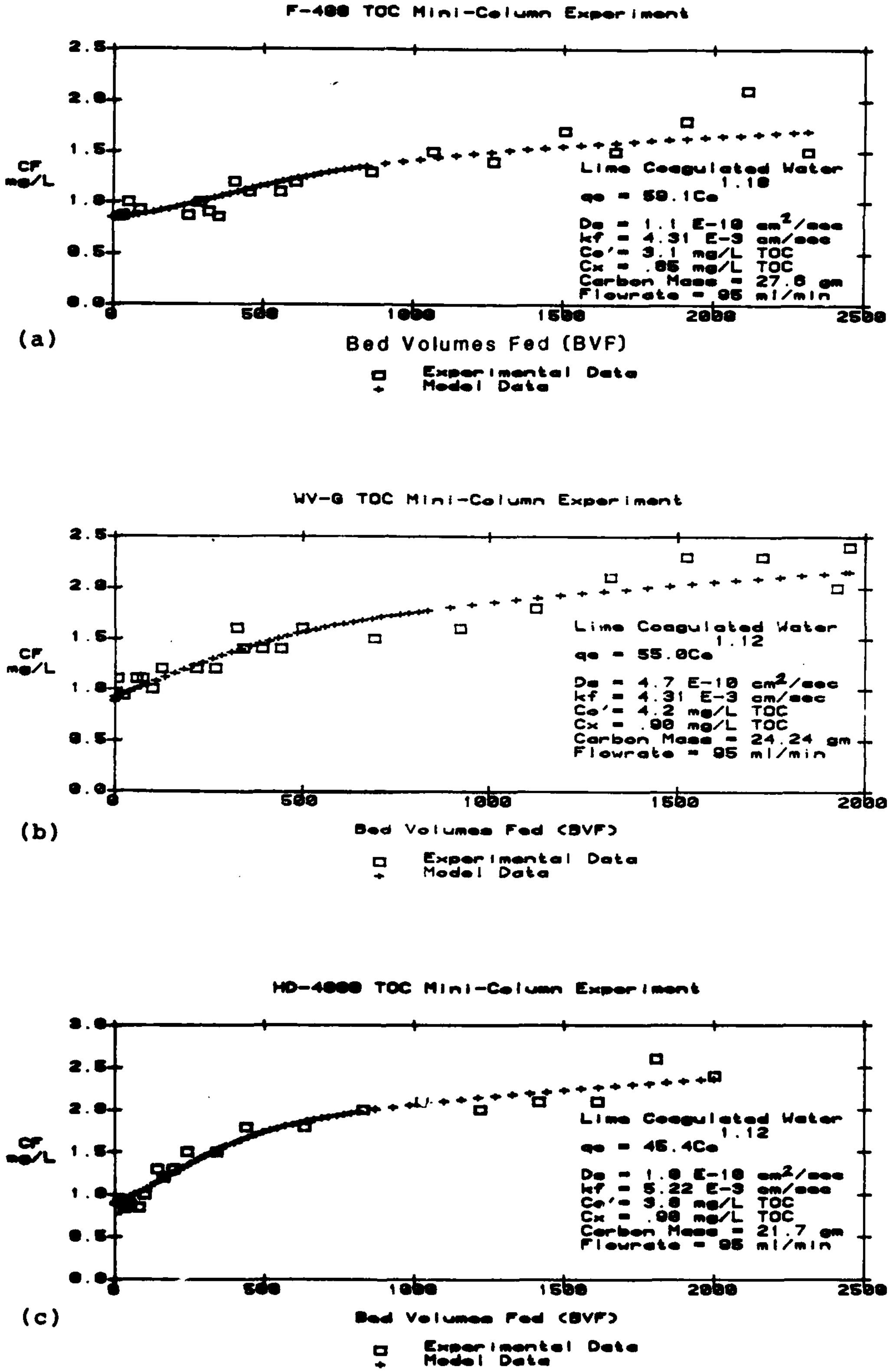
2. For the lime pretreated water, test water was composited over 24-hour durations and isotherm, differential column rate and mini-column tests were conducted using the water from these 24-hour compositing periods. Therefore, the experimental test results used in the LSDP, HSDBM and HSDCM work correspond to the isotherm, rate and mini-column tests, respectively, which were conducted with the "same" water.

3. The experimental data, plotted as bed volumes fed versus C_f (effluent TOC concentration), should be well distributed and adequately defined by the predicted curve from the HSDCM work.

Because the previous bench-scale tests were not designed to accurately determine k_f values, the values used in the HSDCM are likely to be incorrect. Following this concept, the value of k_f for each carbon was varied to produce the best model fit of the experimental data. The best fit was selected based on a least squares calculation which indicates how well the model curve describes the data. The results of the mini-column calibration work are depicted in Figure I.3-11 and Figure I.3-12 for alum/polymer and lime pretreated waters, respectively. Also, below is a summary of the adsorption parameters after calibration. All but the k_f values remain the same.



MINI - COLUMN EXPERIMENTS
PHASE I
FIGURE I. 3-11



MINI - COLUMN EXPERIMENTS
(PHASE II)
FIGURE I. 3-12

Carbon	K	1/n	D_s cm^2/sec	k_f cm/sec	C_x mg/L
F-400					
alum/polymer	72.7	1.03	3.5E-11	1.74E-3	0.6
lime	59.1	1.10	1.1E-10	4.31E-3	0.85
WV-G					
alum/polymer	60.6	0.76	4.9E-10	1.99E-3	0.6
lime	55.0	1.12	4.7E-10	4.31E-3	0.9
HD-4000					
alum/polymer	48.4	1.02	2.8E-10	2.32E-3	0.6
lime	45.4	1.12	1.0E-10	5.22E-3	0.9

A comparison of the final calibrated k_f values with the initial rate test values indicates most were increased 1.5 to 4 times to produce an adequate model representation of the experimental data. The rate test k_f values for F-400 and WV-G, alum/polymer pretreated water were decreased 0.5 to 1.0 order of magnitude during calibration.

Work conducted by Pirbazari (1980) and Lee (1980)document k_f values for humic acid as one order of magnitude less than produced by the work described above. The disparity in values can be attributed to the nature of the waters being tested and the carbon and mesh sizes being used. These differences have been discussed above in the results section for bench-scale differential column rate tests. The values, however, are a tool for comparison which indicate that the EEWTP values are within an acceptable range.

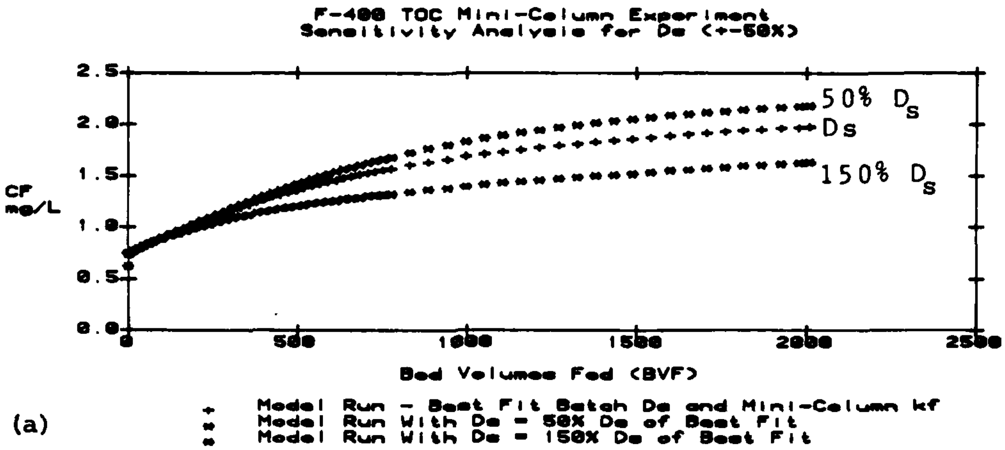
Following a similar analogy used for the rate tests, the sensitivity of the mini-column modeling results were evaluted for k_f should be more sensitive than D_s. Sensitivity analyses for D_s and k_f were conducted using the results for all three carbons during the alum/polymer pretreatment mode. The outcome of the analyses are graphically described in Figures I.3-13 and I.3-14 for D_s and k_f, respectively.

The figues show that both parameters influence the model fit of the experimental data; however, the sensitivity results do indicate that $k_f$is the most sensitive of the two parameters. Calibration of the initial values of k_f used in the HSDCM was imperative to produce a good model fit of the experimental data.

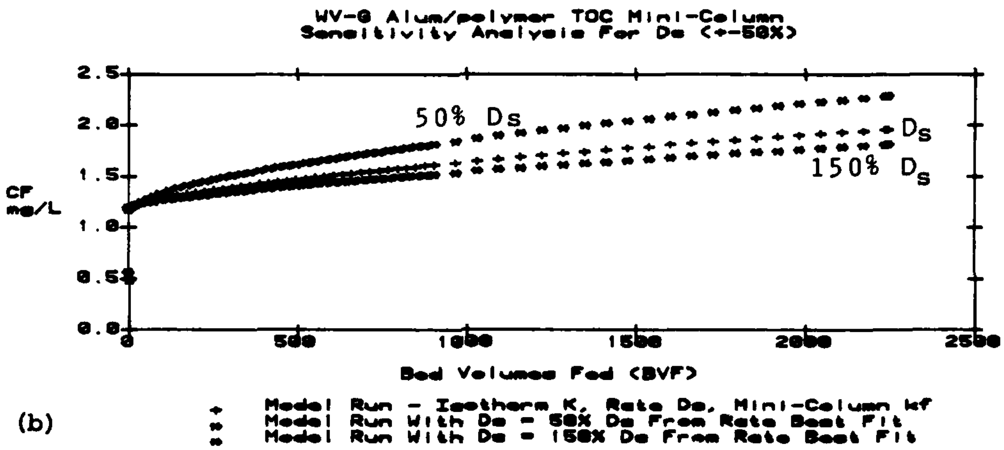
PILOT-SCALE RESULTS AND MODEL VERIFICATION

Alum/Polymer and Lime Pretreatment

A detailed description of the fifteen minute empty bed contact time pilot-column experiments can be found in the Methods section. The test water for both pretreatment modes was pumped from the gravity filter clearwell. Chemi-



(a)



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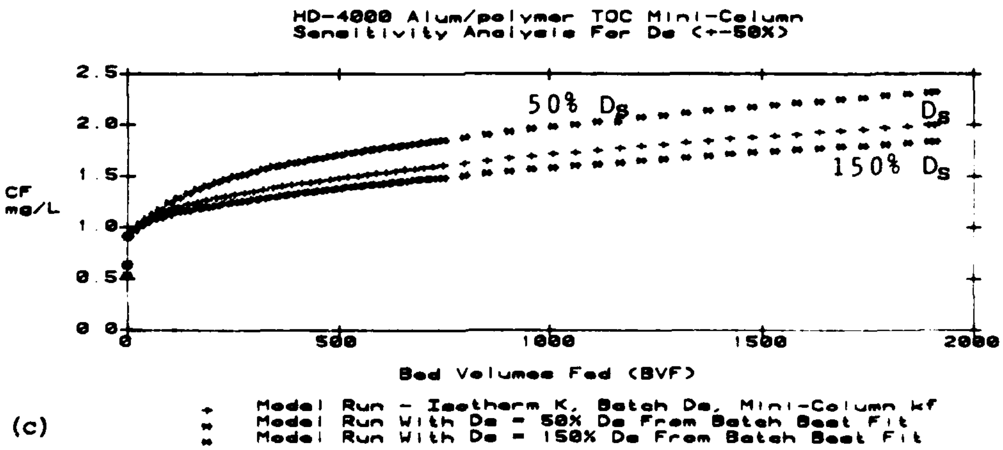
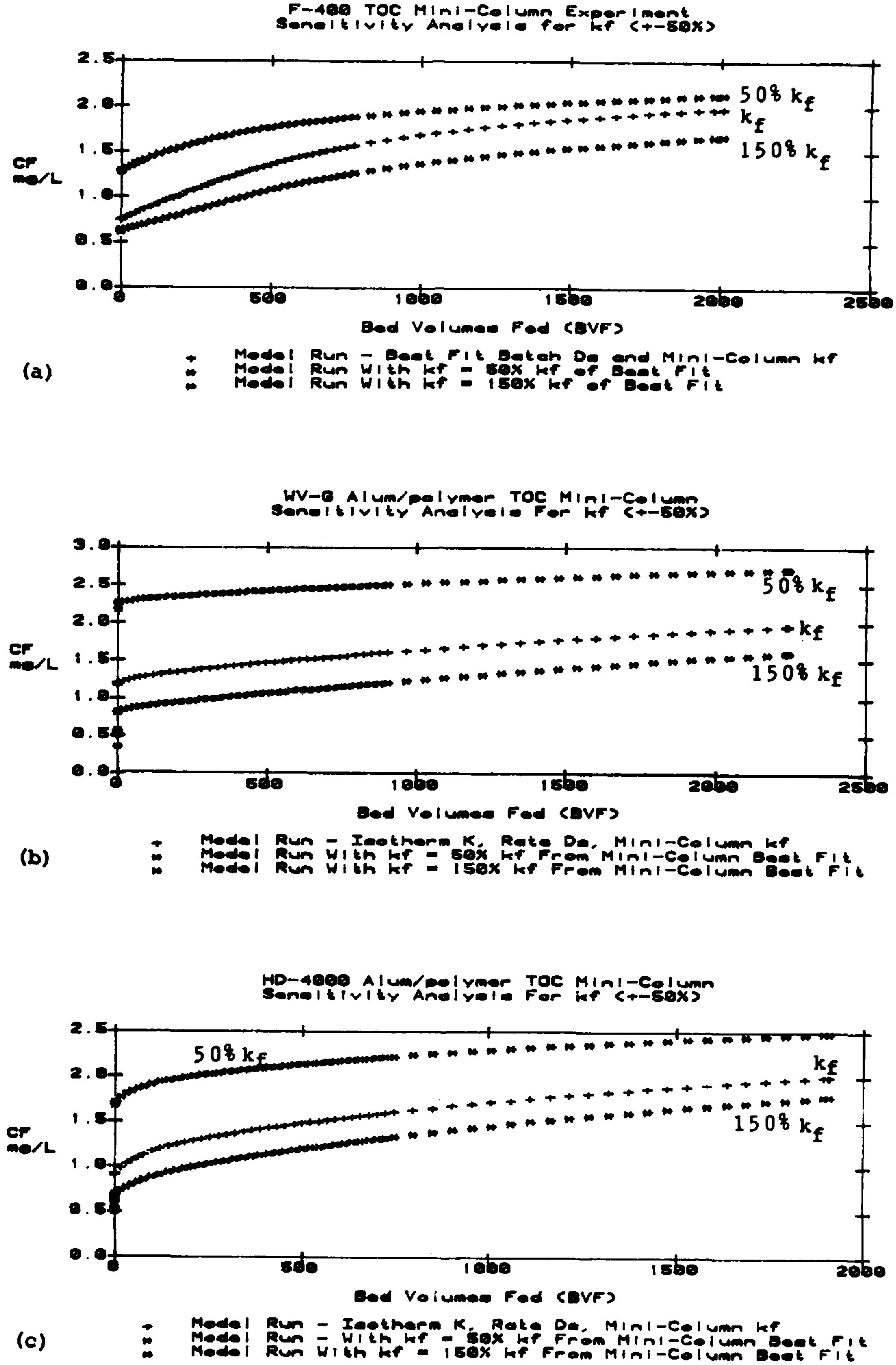


(c)

SENSITIVITY ANALYSES FOR Ds
MINI-COLUMN TEST
FIGURE I. 3-13



SENSITIVITY ANALYSES FOR k_f
MINI-COLUMN EXPERIMENTS
FIGURE I. 3-14

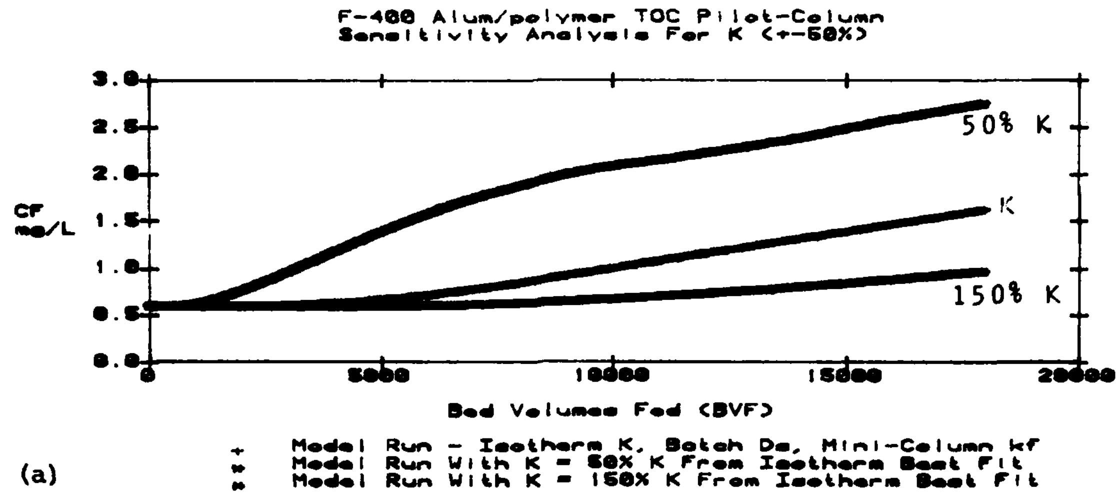
cal pretreatment prior to gravity filtration during pilot-column testing consisted of alum/polymer and pre-chlorination or ozone in Phase I and lime and recarbonation in Phase II. Each pilot-column test ran for approximately a five month duration.

Using the previously determined adsorption parameters, the initial HSDCM runs produced curves which did not fit the observed pilot-column TOC data as well as expected. The pilot-column data did indicate that a non-adsorbable fraction of TOC existed in both pretreated waters; however, the observed non-adsorbed concentrations were approximately 0.2 mg/L TOC lower than previously estimated from the bench work. Decreasing the non-adsorbed TOC fraction did not affect the shape of the model curve but rather, shifted it downward 0.2 concentration units.

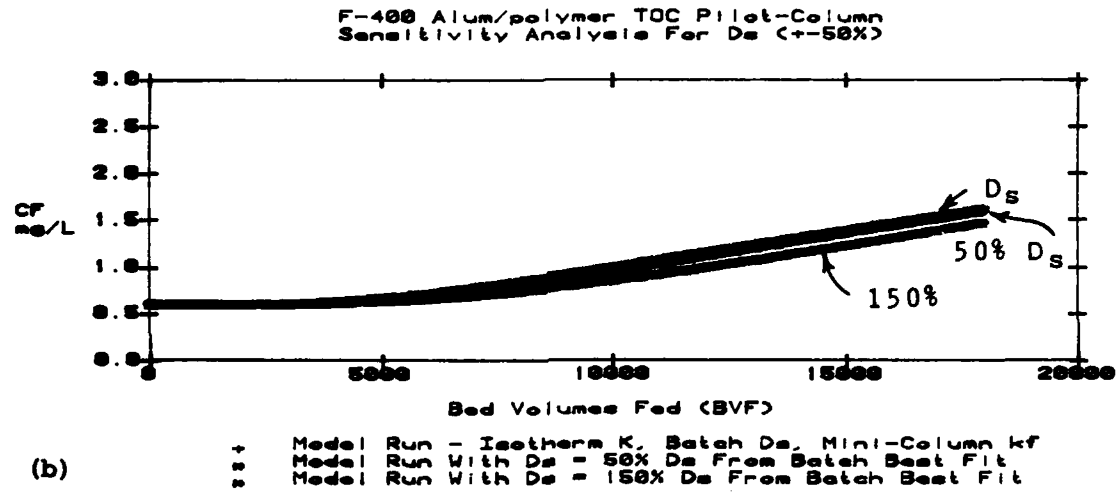
Sensitivity analyses were conducted on K, D_s and k_f to determine which parameter(s) needed adjustment. 1/n was not included in this analysis because, as discussed in the isotherm results, the values determined agree with those documented by others (Cannon and Roberts, 1982 and Lee, 1980). Sensitivity analyses were conducted for only one of the three carbons, F-400. The results from the sensitivity analyses for the rate and mini-column work indicate that the parameters defined by the experimental results for each carbon are similarly sensitive to each parameter evaluated. Therefore, the sensitivities of K, D_s and k_f were analyzed for F-400, alum/polymer pretreated water. The parameter which indicated the highest sensitivity was tested for the two remaining carbons.

Figure I.3-15(a), (b) and (c) are the results of the sensitivity analyses for K, D_s and k_f, respectively using F-400 tested during alum/polymer pretreatment. The sensitivity analyses indicate that the model curve was most sensitive to K, with D_s and k_f having little or no effect on the model fit. Therefore, following the above strategy, sensitivity analyses were conducted with K for WV-G and HD-4000; the results are graphically described in Figures I.3-16(a) and (b), respectively. Again, the same level of sensitivity for K, indicated by the F-400 analyses, occurred for the WV-G and HD-4000 model runs.

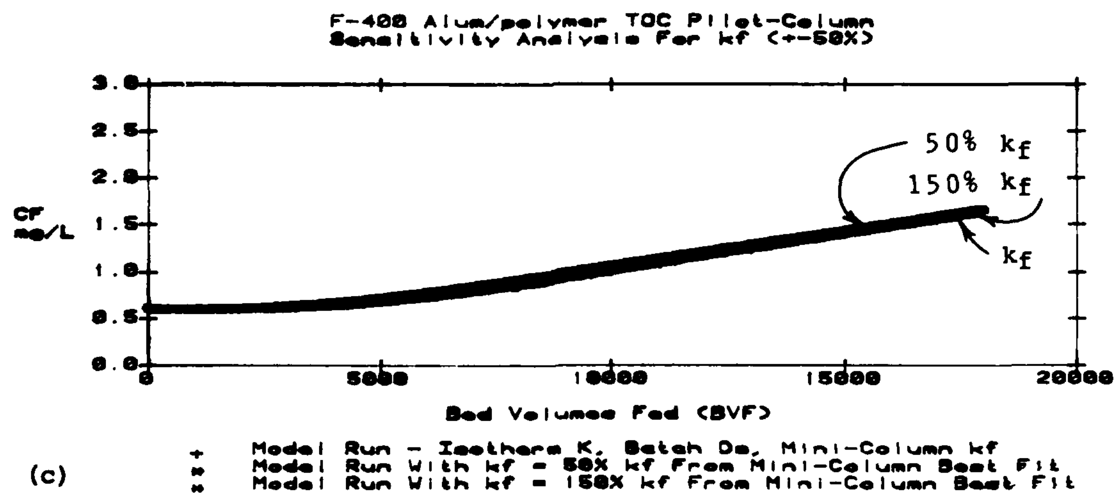
K was then varied for each carbon and pilot-column run in order to determine the K value which produced the "best fit" model curve, based on a least squares error calculation. Figures I.3-17 and I.3-18 are plots of the experimental data and "best fit" model data for alum/polymer and lime pretreatment, respectively. The K value providing the best fit was selected for each carbon and pretreatment. Table I.3-2 is a summary of the calibrated adsorption parameters for each carbon and each pretreatment.



(a)

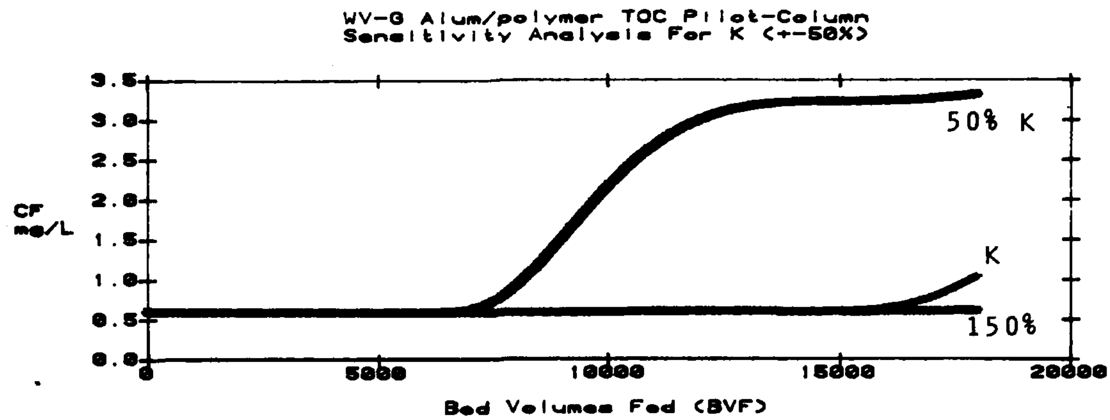


(b)

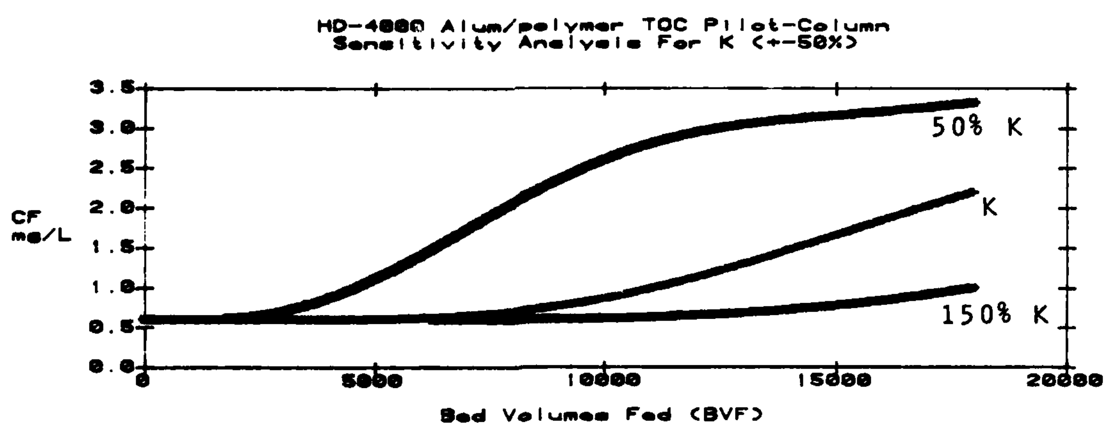


(c)

F-400 SENSITIVITY ANALYSES
PILOT-COLUMN TEST
FIGURE I. 3-15

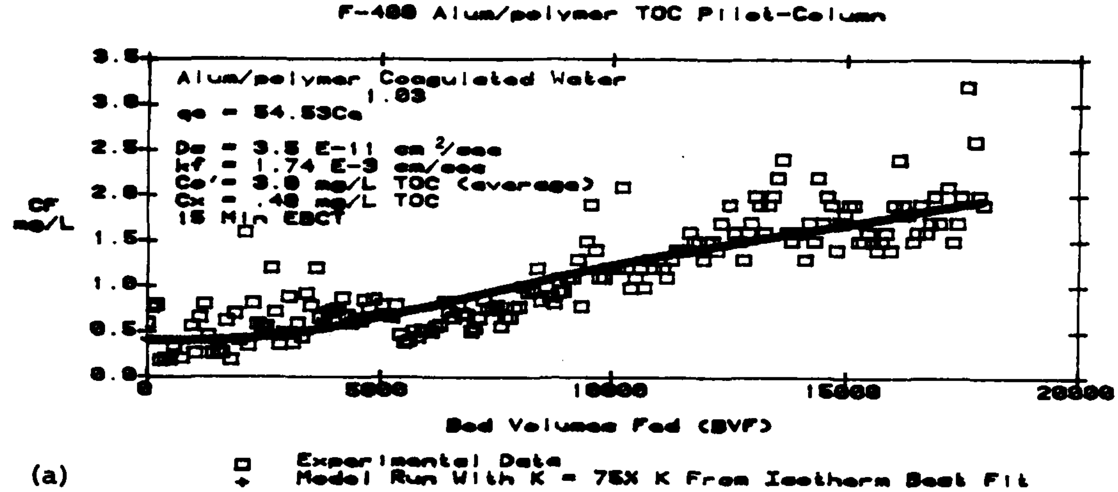


(a) + Model Run - Isotherm K, Rate Ds, Mini-Column kf
* Model Run With K = 50% K From Isotherm Best Fit
* Model Run With K = 150% K From Isotherm Best Fit

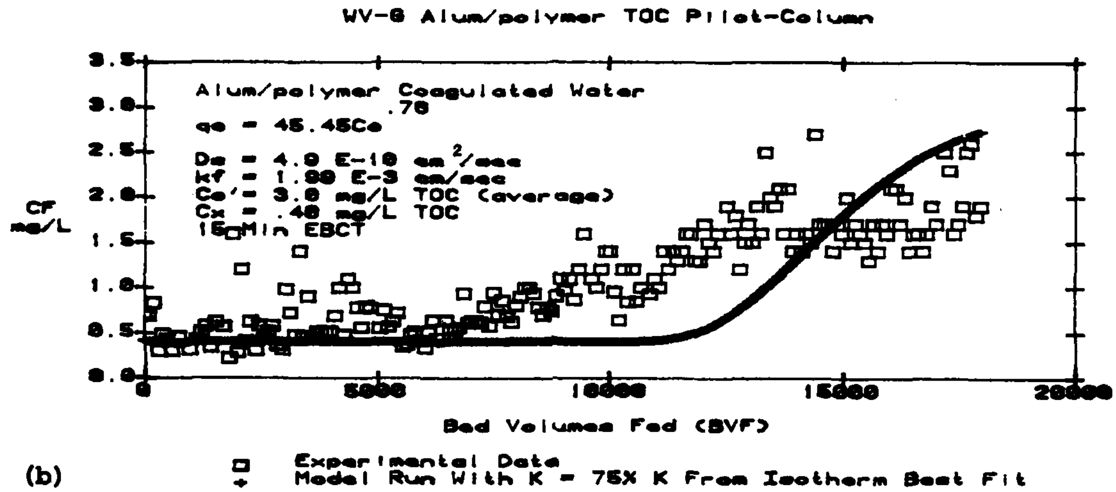


(b) + Model Run - Isotherm K, Rate Ds, Mini-Column kf
* Model Run With K = 50% K From Isotherm Best Fit
* Model Run With K = 150% K From Isotherm Best Fit

SENSITIVITY ANAYLSES FOR K
PILOT-COLUMN TEST
FIGURE I. 3-16



(a)



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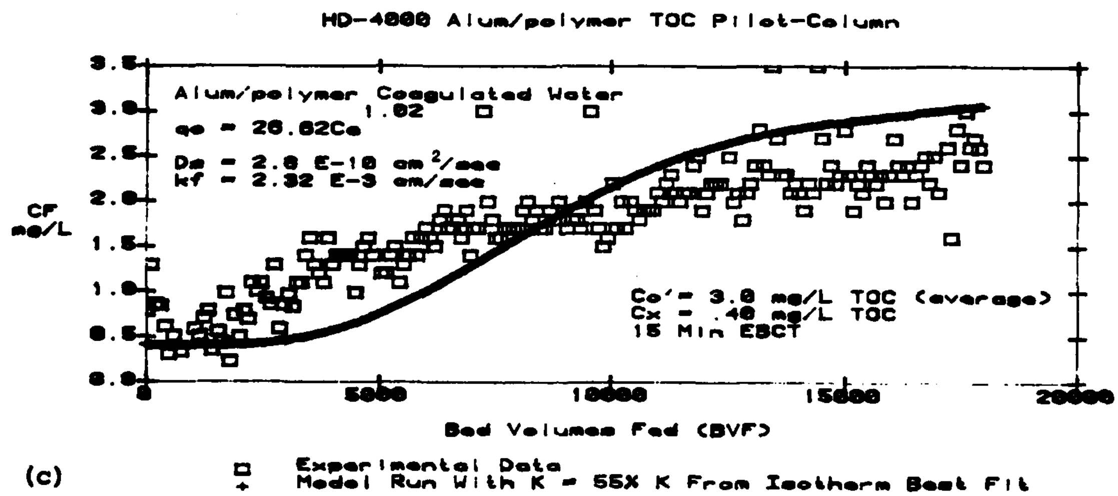
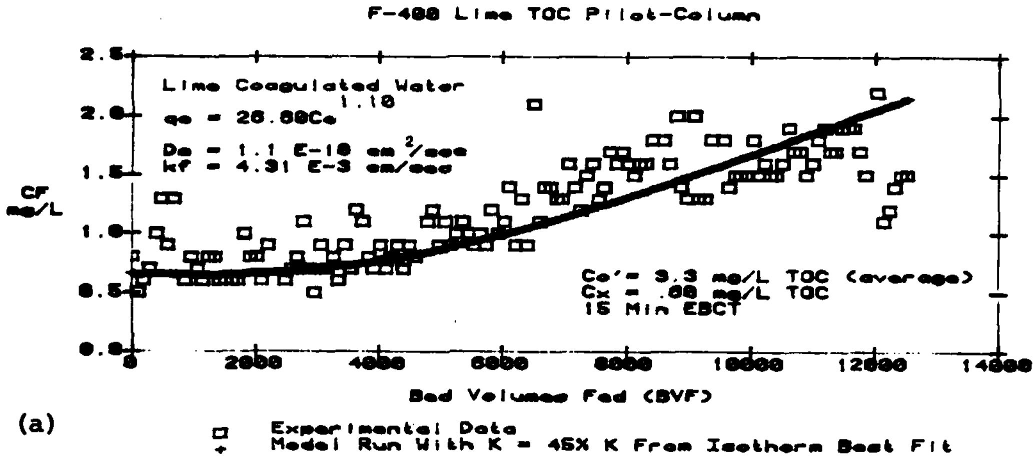
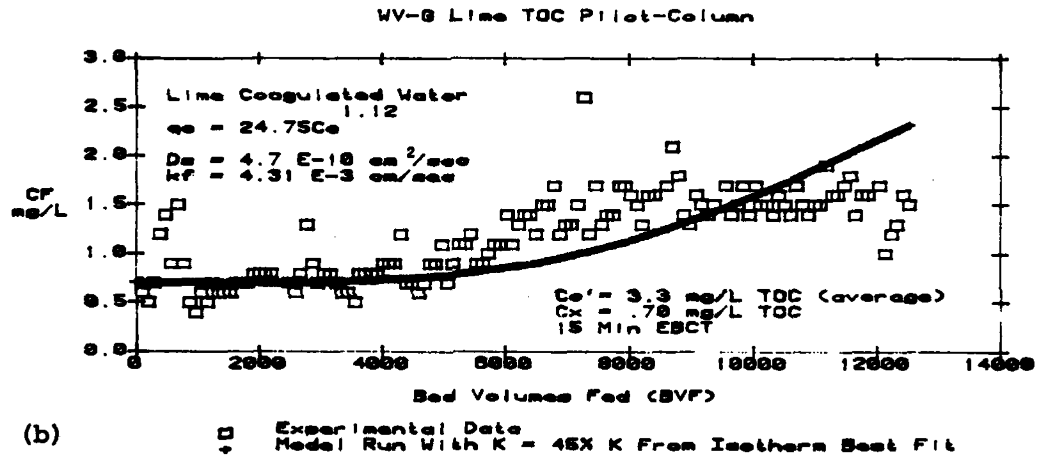


(c)

PILOT-COLUMN TEST
(PHASE I)
FIGURE I. 3-17



(a)



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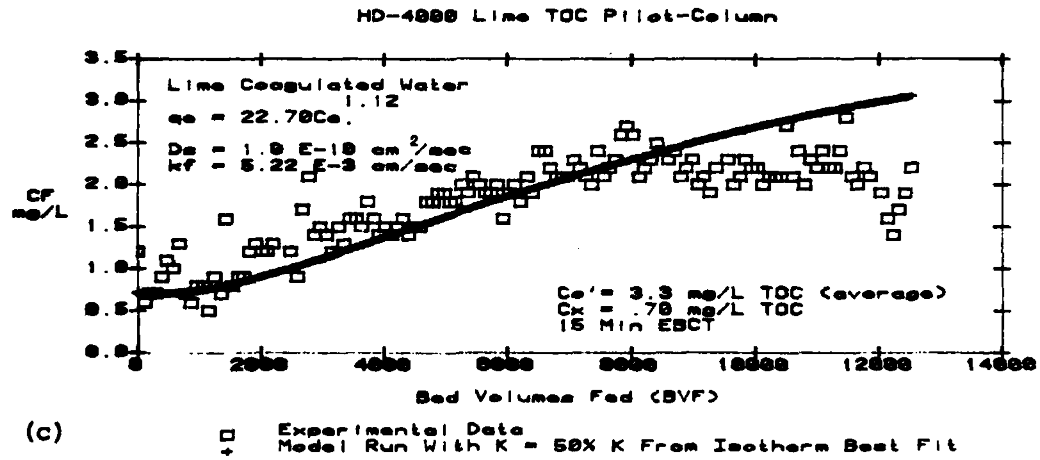


(c)

PILOT - COLUMN TEST
(PHASE II)
FIGURE I. 3-18

TABLE I.3-2

ADSORPTION PARAMETERS FOR THREE CARBONS AND TWO PRETREATED WATERS

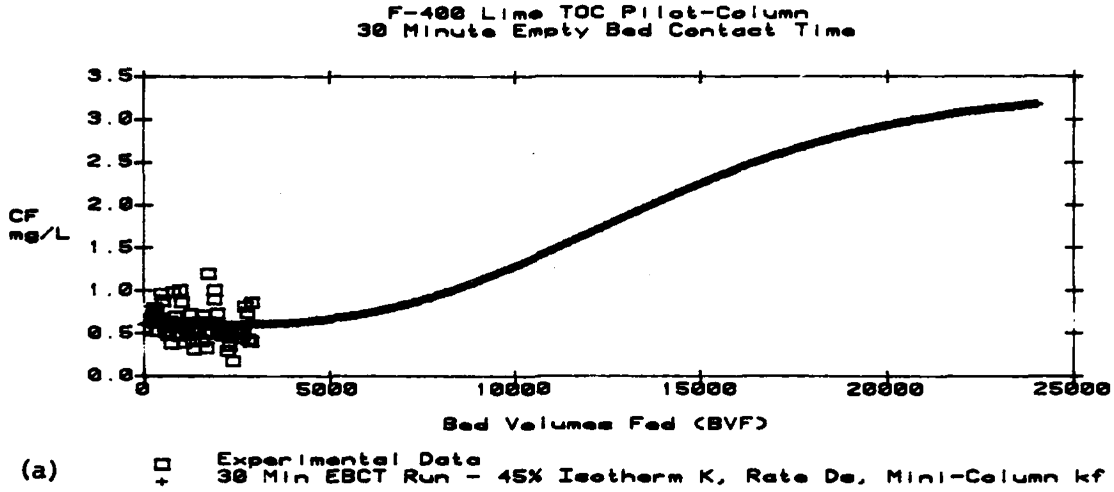
Carbon	K	1/n	D_s cm^2/sec	k_f cm/sec	C_x mg/L-C
F-400					
alum/polymer	54.53	1.03	3.5E-11	1.74E-3	0.4
lime	26.60	1.10	1.1E-10	4.31E-3	0.6
WV-G					
alum/polymer	45.45	0.76	4.9E-10	1.99E-3	0.4
lime	24.75	1.12	4.7E-10	4.31E-3	0.7
HD-4000					
alum/polymer	26.62	1.02	2.8E-10	2.32E-3	0.4
lime	22.70	1.12	1.0E-10	5.22E-3	0.7

The values reported for K in Table I.3-2 indicate that the initial values from the isotherm tests were overestimated by 25 to 45 percent for the alum/polymer pretreated water and 50 to 55 percent for the lime pretreated water. Even after the reductions to insure good "fits" of the pilot-column runs, the final values for K are still two to five times higher than those reported by others. (Lee, 1980 and Roberts and Summers, 1982).

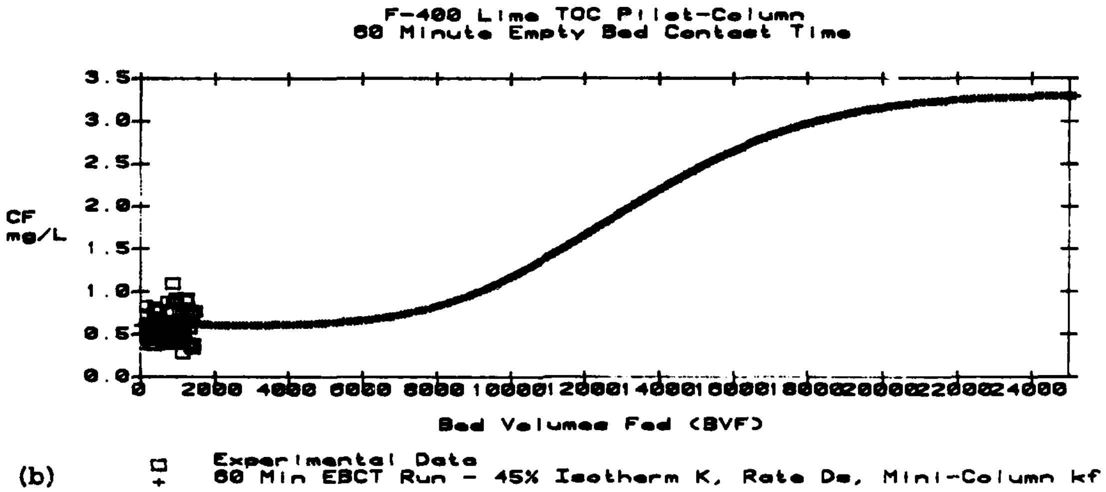
In general, the final model curves describe the pilot-column data well with the exception of WV-G, alum/polymer pretreatment. The model curves for F-400 (both waters) depict the experimental data best followed by HD-4000 and WV-G.

Long Empty Bed Contact Time. The long empty bed contact time (LEBCT) study was conducted over a two month duration from mid-January to mid-March 1983. Pilot-columns were used for a two stage, sixty minute EBCT with two thirty minute EBCT columns in series. The experimental procedure outlined in the Methods section, for pilot-columns, Table I.3-10, was followed for the LEBCT test. F-400 was the carbon tested and lime pretreated water was processed in the LEBCT columns. Influent, intermediate and final sampling ports allowed both thirty and sixty minute EBCTs to be studied.

Two months of accumulated LEBCT TOC data do not provide enough points for verification of the HSDCM at longer EBCT, as shown in Figure I.3-19. The data do, however, verify the occurrence of a non-adsorbed fraction of TOC and define the non-adsorbed fraction accurately. Figure I.3-19(a) and (b) are plots of the experimental and model data at thirty and sixty minute EBCTs, respectively. Each set of model data was produced using experimental data and the verified adsorption parameters of F-400, lime (see Table I.3-2) in the HSDCM.



(a)



(b)

F-400
30 AND 60 MINUTE EBCT TEST
FIGURE I. 3-19

The experimental data for each EBCT indicate the presence of a 0.6 mg/L-C non-adsorbed fraction of TOC in the lime pretreated water for F-400. This result is in agreement with the non-adsorbed concentration for F-400 defined in the fifteen minute EBCT pilot-column.

Plant-Scale Modeling - Model Verification

The final step in the TOC modeling work was to evaluate how well the adsorption parameters, determined through bench and pilot-scale experimental work, could model the plant-scale data. F-400 carbon was used in the plant-scale GAC process during Phase II of operation. Therefore, the F-400 adsorption parameters for lime pretreated water were used to model the Phase II. TOC data. The results of this modeling exercise are depicted in Figure I.3-20. As the figure indicates, the model predicted TOC breakthrough curve does describe the observed plant-scale TOC data very well. The plant-scale data suggests, however, that the non-adsorbed TOC fraction may be 0.4 mg/L-C as opposed to the predicted 0.6 mg/L-C. Besides this minor disparity, the adsorption parameters defined through bench and pilot-scale work accurately predicted the plant-scale TOC breakthrough curve.

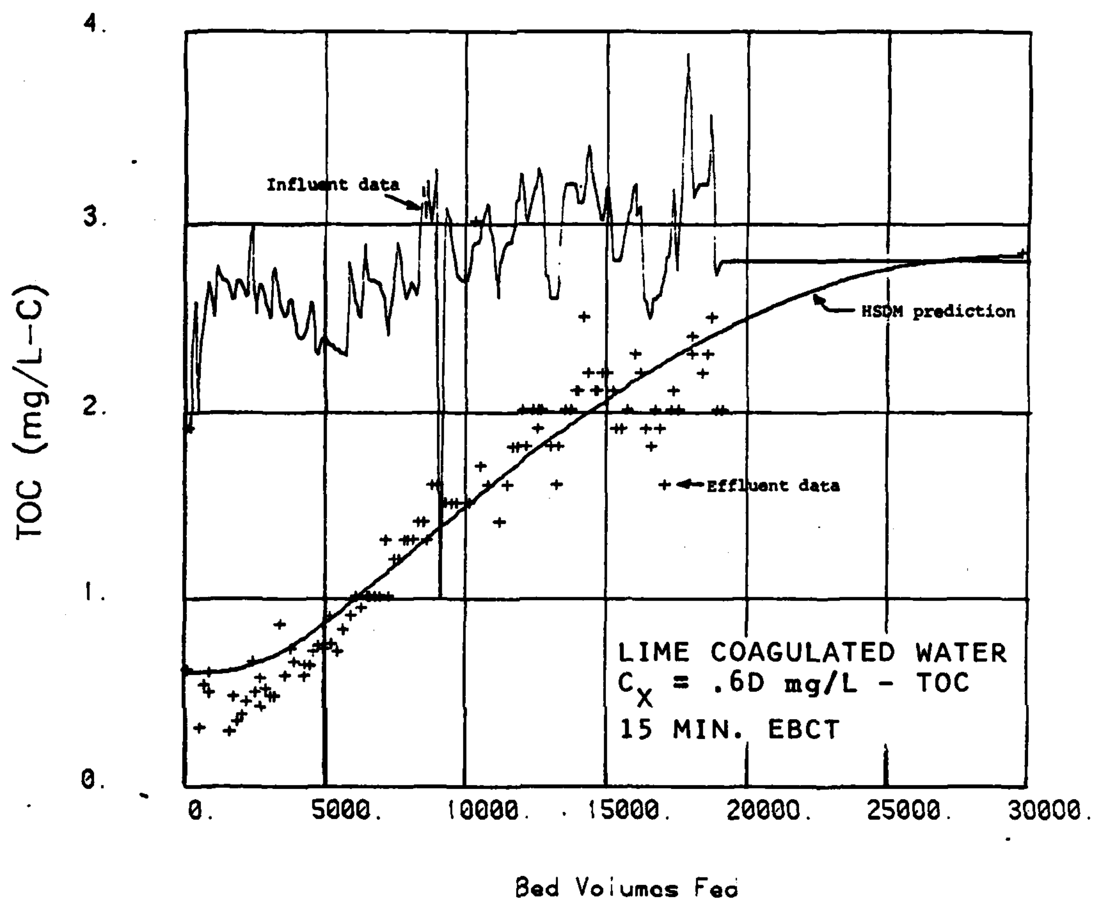
PCE Spike

The PCE spiking study was conducted during May and June 1982 using the exhausted carbons (five months on-line, average effluent TOC=3 mg/L) in the pilot-column test with the alum/polymer pretreated water. A stock solution was prepared in a 50 gal drum at a concentration within 5 mg/L of the 150 mg/L-PCE solubility limit. The stock solution was pumped into a pipe containing static mixers, was blended into the pilot-column influent, and added to the columns at a concentration of 2.2 mg/L-PCE. Influent column PCE samples, however, revealed that the actual concentration entering the carbon beds was between 1.1 and 1.5 mg/L-PCE, a fifty percent reduction from the desired level. The spiking test covered an eleven day duration of which PCE was spiked into the influent the first five days. The rationale for the five day spiking period is discussed below.

Desorption of compounds from a carbon bed treating a spiked influent is dependent on the following:

1. Available adsorption sites for the spiked compound.
2. Depth in carbon bed to which the spiked compound penetrates.
3. Available adsorption sites, which have not come in contact with the spike, where desorbed compounds can re-adsorb.

To insure that compound desorption and the spiked compound are detected in the column effluent, the number of bed volumes of spiked influent treated by the carbon bed must produce breakthrough of the spiked compound. Using the equations defined below, Dobbs and Cohen (1980) PCE equilibrium adsorption parameters, and the proposed MCL for PCE of 5 to 500 mg/L, (Federal Register, 1982), the BV to be treated were calculated.



TOC BREAKTHROUGH CURVE
PLANT-SCALE, F-400
(PHASE II)
FIGURE I. 3-20

$$BV = \frac{Qt}{V} = \frac{a\,q_e}{C_o}$$

where: $Q = 4.5$ gpm/ft^2
V = volume of carbon bed
a = absolute density of carbon
$q_e = KC_e^{1/n}$
$K = 50.8$
$1/n = 0.56$
$C_e = 5$ µg/L
$C_o = 2.2$ mg/L

The calculation indicated that 500 BV of spiked influent at 2.2 mg/L-PCE would be needed for a PCE breakthrough at 5 µg/L to occur. Approximately, 100 BV/day were treated by each pilot-column; therefore, five days of continual PCE spiking were required.

Two important experimental factors which influenced the experimental results are discussed herein. First, is the fact that the actual PCE influent spike was at a concentration of 1.1 to 1.5 mg/L-PCE. This lower influent concentration level required that, at most, a ten day influent spike was necessary for breakthrough. Second, using the results of this project's PCE isotherm work (see Isotherm Test discussion) and a C_o=1.1 mg/L, the BV treated to insure a PCE breakthrough was recalculated to be on the order of 12,000 BV or 120 days. Because the experiment was designed for only a five day PCE influent spike the occurrence of neither desorption nor breakthrough occurred is expected.

LLE (including PCE and THMs), TOX and TOC were sampled in the influent and effluent streams throughout the spiking test. None of the parameters measured indicated that desorption or breakthrough occurred. The 31 LLE samples analyzed indicated that the PCE concentration in the effluent never exceeded 0.5 µg/L and generally was 0.1 µg/L. $CHCl_3$, $CHClBr_2$, and $CHCl_2Br$ were constant in the effluent at 12, 0.6 and 3.2 µg/L, respectively, throughout the ten day duration of the study. Influent TOX concentrations ranged from 800 to 1,000 µg/L-Cl during spiking and decreased to an average of 75 µg/L-Cl after spiking. Although the influent TOX varied over a wide range, the effluent TOX remained at a consistent 55 and 75 µg/L-Cl for the bituminous and lignite based carbons, respectively.

TOC was the only parameter which showed effluent concentration variability. The variability, however, occurred only during the five days of PCE spiking and was related to the methane used to maintain the PCE in solution, during the initial stock solution preparation. The results of the study verify that neither desorption nor PCE breakthrough were detected in the columns' effluent.

The test does, however, bring out a very important concept pertaining tc spills. The spiking test was conducted with exhausted carbons which, if in a full-scale plant, would have been regenerated well before the effluent levels were 3 mg/L-TOC. However, even with the exhausted carbons, there was sufficient adsorption capacity available for the continued removal of PCE by the carbons. In addition, the other SOCs measured by LLE analysis did not breakthrough the

carbon columns due to desorption by PCE. Whatever quantities of the SOCs which were displaced by the PCE spike moving through the columns were successfully readsorbed in the lower regions of the GAC columns. These results indicate the carbons have sufficient capacities for the compounds analyzed and functioned well as barriers to the influent PCE spike tested.

APPLICATION TO DESIGN

TREATMENT OBJECTIVES

Three treatment objectives were selected for investigation for design. However, the results of the bench-scale and pilot-scale work indicate the presence of a non-adsorbed fraction of TOC varying with each carbon and each pretreated water tested. Therefore, to provide an equitable comparison of the different carbons, it is necessary to evaluate the carbons relative to a required level of treatment with respect only to the adsorbable TOC.

A regulated MCL for TOC has not been established by EPA; therefore, selection of the three TOC treatment objectives was based on present practice in the water industry. Roberts and Summers (1982) summarized information pertaining to 36 treatment facilities in the United States and Europe which utilize the GAC process. The "typical water treatment" conditions noted in the article suggest that the range of GAC TOC effluent concentrations is 0.5 to 2.0 mg/L-C. Using this information, 0.5, 1.0 and 1.5 mg/L-C were selected as the adsorbable TOC treatment objectives.

The non-adsorbed fraction for each carbon was added to each T.O. producing a specific set of TOC effluent goals for each carbon and pretreatment. Below is a summary of the treatment objectives which were used in the development of the preliminary design alternatives.

Carbon	Non-Adsorbed TOC Fraction C_x, mg/L-C	Treatment Objective Total TOC mg/L-C TO_1[a]	TO_2[b]	TO_3[c]
Alum/Polymer				
F-400	0.4	0.9	1.4	1.9
WV-G	0.4	0.9	1.4	1.9
HD-4000	0.4	0.9	1.4	1.9
Lime				
F-400	0.6	1.1	1.6	2.1
WV-G	0.7	1.2	1.7	2.2
HD-4000	0.7	1.2	1.7	2.2

a. TO_1 = 0.5 mg/L adsorbable TOC + non-adsorbable TOC fraction
b. TO_2 = 1.0 mg/L adsorbable TOC + non-adsorbable TOC fraction
c. TO_3 = 1.5 mg/L adsorbable TOC + non-adsorbable TOC fraction

ALTERNATIVE EBCTs

As with the treatment objectives, three EBCTs were selected for evaluation with respect to GAC design. The information summarized by Roberts and Summers (1982) indicates that the range of GAC EBCTs in water treatment plants is 3 to 34 minutes for TOC adsorption. According to calculations performed by Dr. Crittenden, for this project, the mass transfer zone in a column for TOC adsorption may require an EBCT of 120 minutes to insure that the adsorbable TOC fraction is 100 percent adsorbed. Utilizing both sources of information, 15, 30, and 60 minute EBCTs were chosen for evaluation.

CARBON SELECTION

Three carbons F-400, WV-G, and HD-4000 have been experimentally evaluated and their corresponding adsorption parameters determined. Only one was used for the preliminary GAC design of the 200 MGD water treatment plant. Selection of the carbon for design was based on the folllowing points.

1. Structure of the carbon - hardness, density.
2. Equilibrium capacity - based on bench and pilot-scale experimental work.
3. Theoretical usage rates based on the "lowest possible carbon dose" calculation.

Structure

In terms of structure, the carbons can be categorized as either bituminous or lignite based carbon; F-400 and WV-G are the former and HD-4000 the latter. Bituminous-based carbons are known for their hardness and low attrition rate while lignite-based carbons are soft and have a higher attrition rate. Because of these structural differences, the potential exists that a bituminous-based carbon will maintain its particle size and pore structure through handling and regeneration longer than the lignite-based carbon.

Also, because bituminous-based carbons are more dense than lignite-based, more carbon can be used in a column for the adsorption process. The implication, of this point, is as follows:

1. Assuming 25,000 lbs of bituminous or 20,000 lbs of lignite-based carbon fit into a column and
2. both carbons have the same usage rate, i.e. 5,000 lbs/day then
3. every five days a column filled with bituminous-based carbon must be regenerated and every four days a column with lignite-based carbon must be regenerated.

Thus, the frequency of column regeneration could potentially be less for the bituminous-based versus the lignite-based carbon.

The structural differences, discussed above, between the carbons suggest a bituminous-based carbon should be used in the preliminary design.

Equilibrium Capacity

Below is a tabular summary of the equilibrium capacities associated with each carbon, for each pretreated water. A solution concentration (C_e) of 1.5 mg/L-C has been used for the q_e calculations.

where: $q_e = KC_e^{1/n}$

Carbon	K	1/n	q_e mg/gm
Alum/Polymer			
F-400	54.53	1.03	82.8
WV-G	45.45	0.76	61.9
HD-4000	26.62	1.02	40.3
Lime			
F-400	26.60	1.10	41.6
WV-G	24.75	1.12	39.0
HD-4000	22.70	1.12	35.7

A comparison of the calculated capacities indicates that F-400 has the highest capacity for TOC for both alum/polymer and lime pretreated waters. Although total regeneration costs are a function of carbon mass used and would be roughly the same for both types of carbons, there could be some savings associated with reduced carbon handling for the bituminous-based carbons.

Lowest Dose Calcuation

The "lowest possible carbon dose" calculation utilizes the equation defined below.

$$QC_o = M_c q_e + C_F Q$$

where: Q = 757 E6 Lpd (200 MGD)
C_o - influent TOC concentration, mg/L
M_c - mass of carbon used per day
q_e - evaluated at $C_e = C_o$
C_F - carbon column effluent TOC concentration, equal to the desired treatment objective.

The equation is a mass balance which assumes the effluent TOC level of the carbon column is a constant concentration equal to the treatment objective. Three treatment objectives (T.O.) for each carbon and each pretreatment were used in the carbon dose calculations, see Treatment Objectives section above. The influent concentration was established as 3.2 mg/L-TOC, an average of the influent concentration for the alum/polymer and lime pilot-column runs. A

summary of the "lowest possible carbon dose" calculations are presented in Table I.3-3.

TABLE I.3-3
LOWEST POSSIBLE CARBON DOSE CALCULATION

	Treatment Objective mg/L-C			q_e	M_c lb/day x 10^3		
	1	2	3	mg/gm	TO_1	TO_2	TO_3
Alum/Polymer							
F-400	0.9	1.4	1.9	157.5	24.35	19.06	13.76
WV-G	0.9	1.4	1.9	99.4	38.58	30.19	21.81
HD-4000	0.9	1.4	1.9	76.1	50.39	39.44	28.48
Lime							
F-400	1.1	1.6	2.1	76.1	46.01	35.06	24.10
WV-G	1.2	1.7	2.2	69.1	48.26	36.20	24.13
HD-4000	1.2	1.7	2.2	63.3	52.68	39.51	26.34

From the information contained in Table I.3-3, a comparison of the three carbons can be made, the result of which indicates that F-400 is the most economical in terms of usage rate. This result was the same for both pretreated waters; although, the disparity between the three carbon's usage rates was not as significant for the lime phase.

Summary

On the basis of structural properties, estimated equilibrium capacity and predicted usage rate, F-400 was selected as the carbon for the preliminary GAC design work. This particular carbon possesses the durability which is characteristic of bituminous-based carbon and has the highest equilibrium capacity for TOC and the lowest usage rate of the three carbons tested.

MODELING RESULTS

Breakthrough Curves

The modeling work consisted of predictions for single column TOC breakthrough curves as well as TOC breakthrough curves for a large number of columns operated in parallel. Three EBCTs and two pretreated waters were evaluated for each, using the adsorption parameters defined for F-400 by the bench and pilot-scale work.

Before the modeling work to evaluate EBCTs and T.O.s could be conducted, column specifications had to be produced for the 200 MGD preliminary GAC

design. The specifications, height, diameter, flowrate and weight of carbon, are required for each EBCT as input to the HSDCM. Output from the HSDCM runs were then used as input to the corresponding parallel column model runs. These assumed design specifications are presented in the Preliminary Design section. The model predicted usage rates are discussed below.

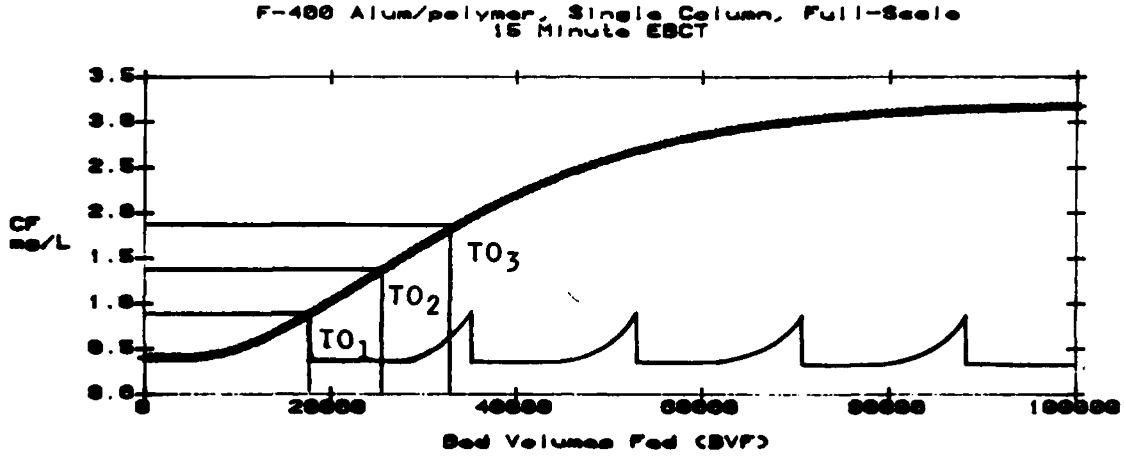
Figures I.3-21 and I.3-22 are the single column TOC breakthrough curves for the alum/polymer and lime pretreated waters, respectively. Figure I.3-22 depicts one set of the parallel column TOC breakthrough curves for the fifteen minute EBCT. The parallel column runs for the other EBCTs produced similar results and are, therefore, not shown.

For the single column model runs a treatment objective criteria is not included. The model predictions, for TOC adsorption, produce complete TOC breakthrough curves which extend beyond the treatment objectives. If regeneration is assumed when a treatment objective is met, then a saw-tooth type curve would be produced similar to that shown in Figure I.3-21(a). A comparison of the TOC breakthrough curves for the alum/polymer and lime pretreated waters indicates the F-400 carbon treats 30 to 50 percent less bed volumes of water during the lime phase versus the alum/polymer phase. This disparity between the pretreated waters suggests that higher usage rates, and therefore, increased regeneration frequencies might be associated with the lime pretreated water.

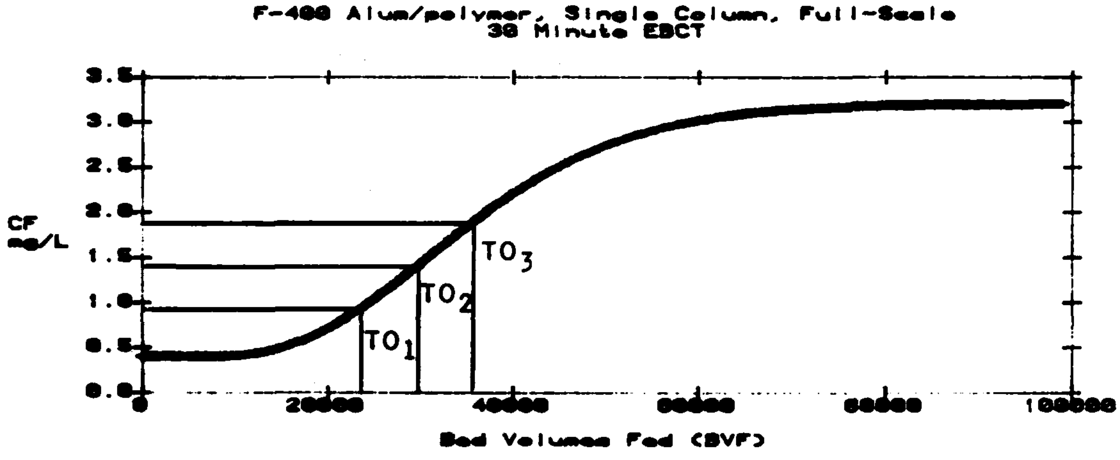
The parallel column TOC breakthough curves are model predictions for thirty-one columns in parallel with a treatment objective applied to the blended effluent of all the columns. A very fine saw-tooth shape is produced for each of the parallel column breakthrough curves. The area between the sawteeth and the treatment objective is an indicator of the amount of TOC capacity in the column(s) which is unutilized at the time of regeneration. Therefore, the finer the sawteeth, the more efficiently the carbon is being utilized. A comparison of the sawteeth incorporated into Figure I.3-21(a) with those in Figure I.3-23(a) indicates the operation mode which monitors the blended effluent, utilizes the carbon more efficiently than monitoring the effluent from individual columns. Parallel column operation allows for a more efficient use of the carbon because the individual column effluents are blended and the blend is monitored for TOC. Blending the effluents provides the opportunity for the carbon in each column to become exhausted while others have virgin or partially exhausted carbon. Therefore, at the some point in time, some columns surpass the T.O., others are equal to or less than the T.O., and the blend meets the T.O.

Usage Rates

The TOC breakthrough curves provide information pertaining to the number of bed volumes treated before the treatment objective is met and regeneration required. Bed volumes treated prior to regeneration can be converted into a usage rate, lbs/MG, which in turn is used to help determine costs associated with regeneration. Higher usage rates are associated with higher costs for GAC regeneration.



(a)



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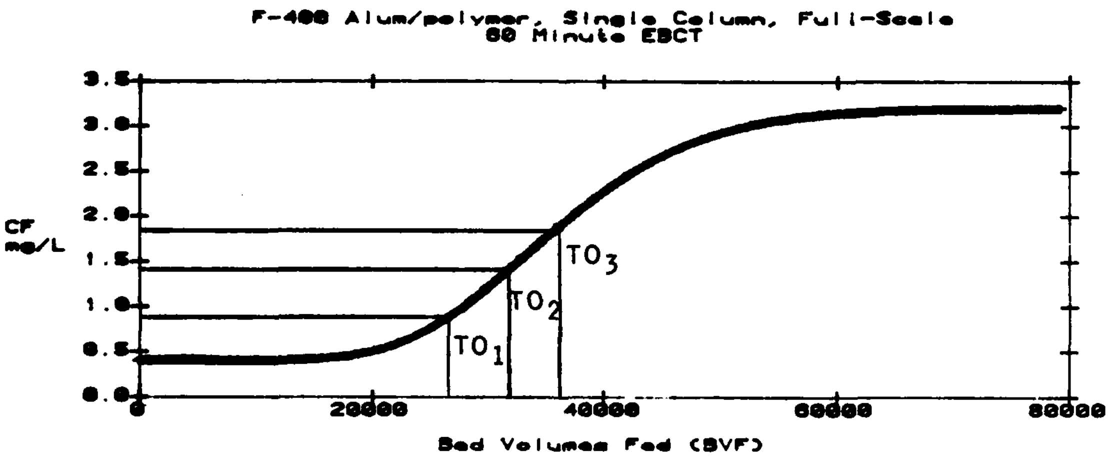
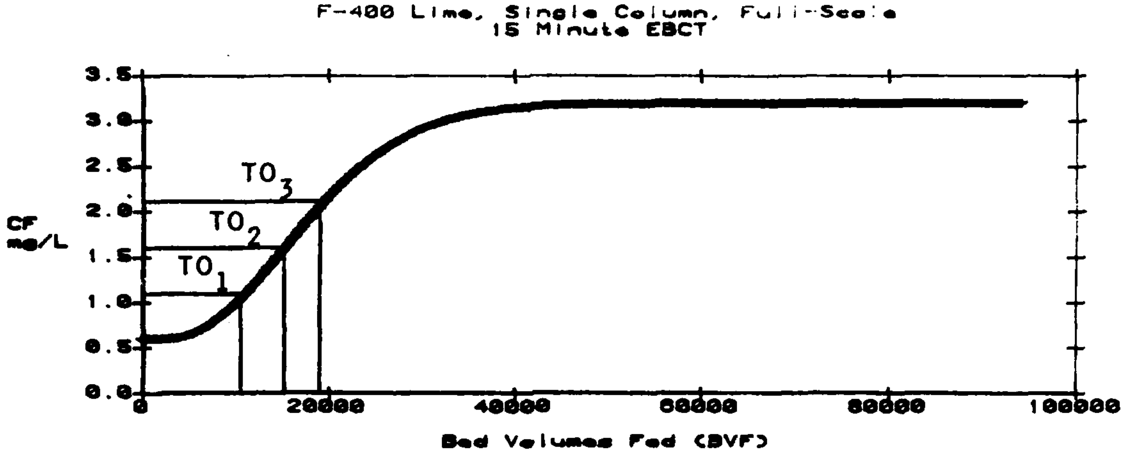


(c)

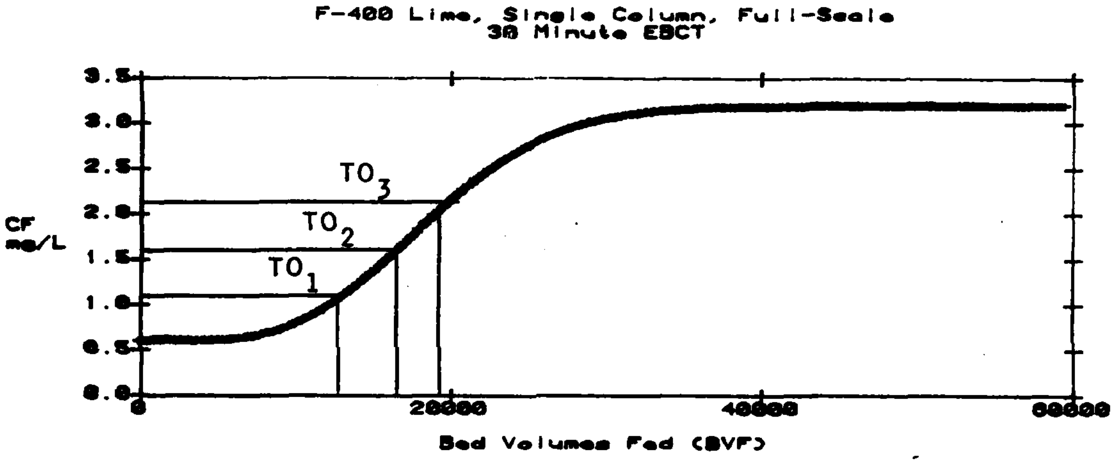
SINGLE COLUMN BREAKTHROUGH CURVES

PHASE I

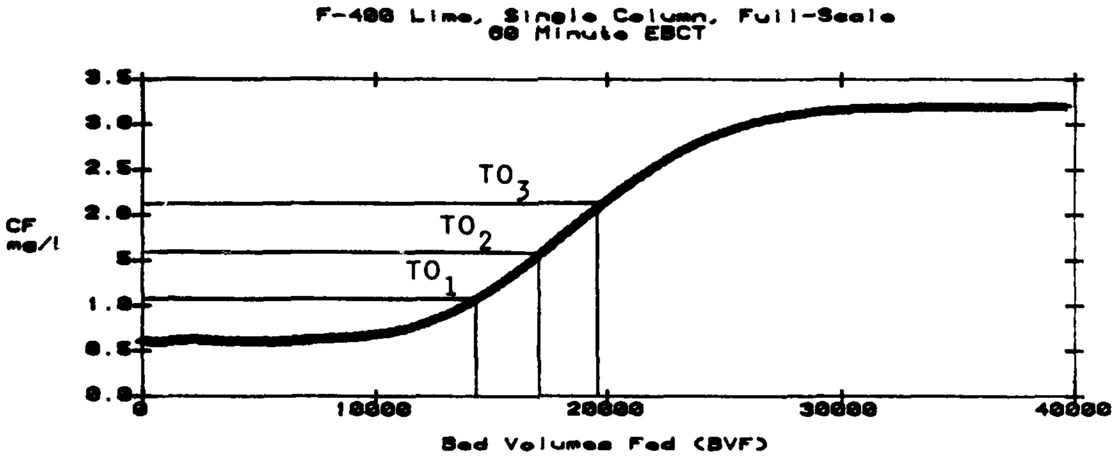
FIGURE I. 3-21



(a)



(b)

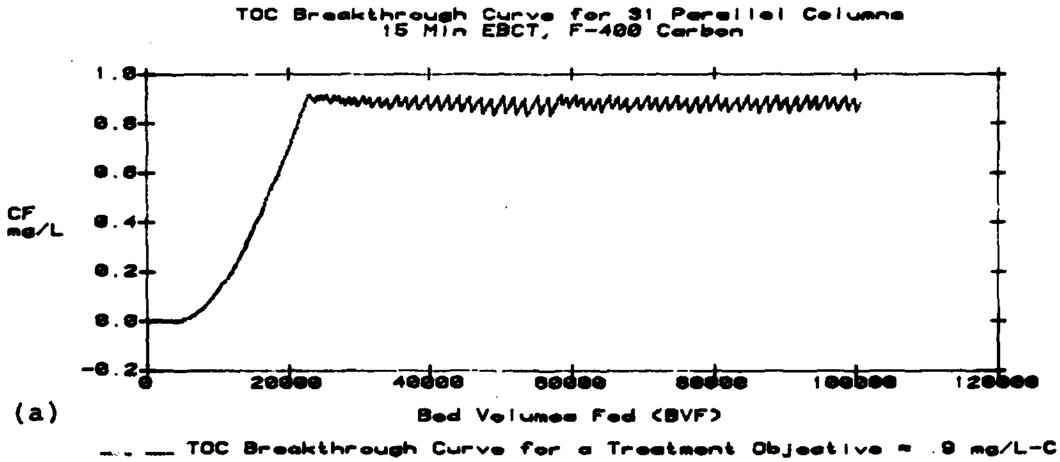


(c)

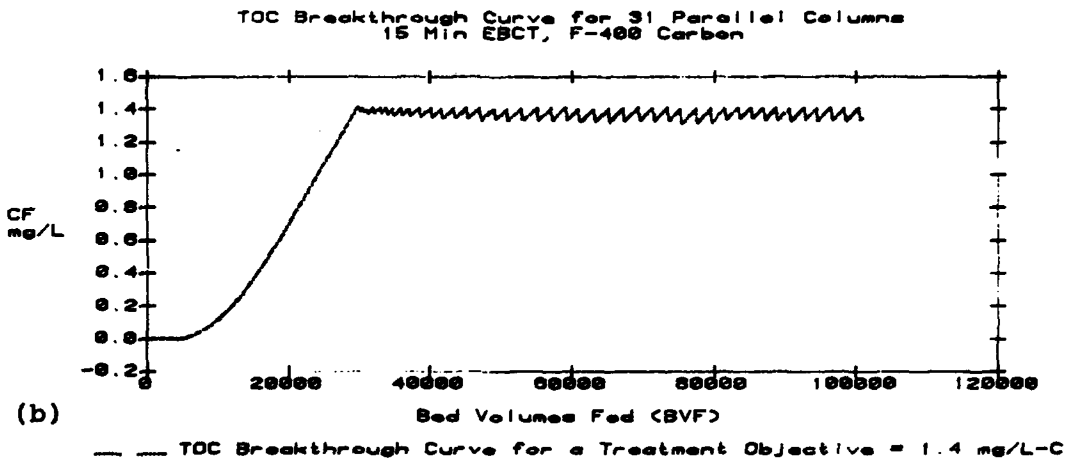
SINGLE COLUMN BREAKTHROUGH CURVES

PHASE II

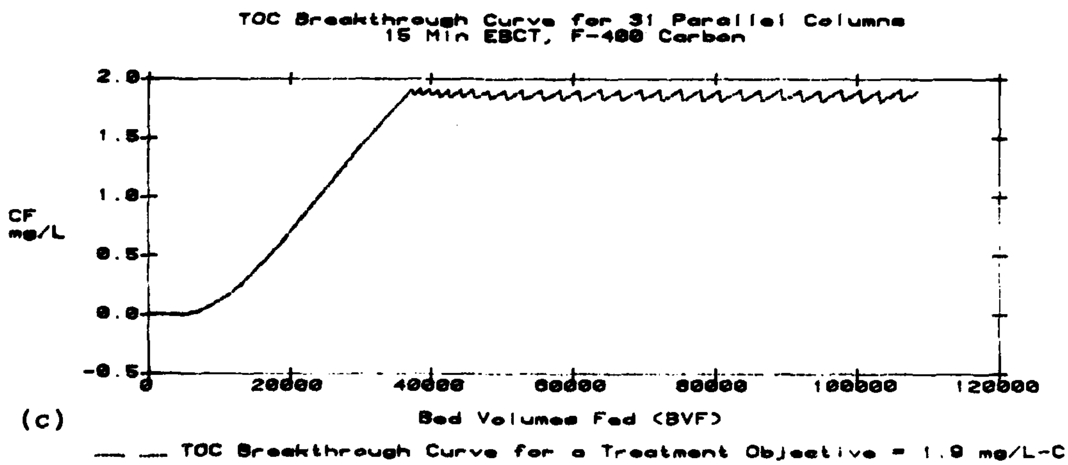
FIGURE I. 3-22



(a)



(b)



(c)

TOC BREAKTHROUGH CURVES
31 PARALLEL COLUMNS
THREE TREATMENT OBJECTIVES
(PHASE I)
FIGURE I. 3-23

The equation used to calculate the usage rates is defined below:

$$UR = \frac{W_C}{Q} \quad \frac{BV_C}{BVF}$$

where: UR = usage rate, lbs/MG
W_C = total weight of carbon used, lbs
Q = daily flow, MGD
BV_C = bed volumes treated per day per column
BVF = bed volumes fed until regeneration

The calculated usage rates for each EBCT, treatment objective and mode of operation are depicted in Figure I.3-24(a) and (b) for alum/polymer and lime pretreatment, respectively. The usage rates associated with single column effluent monitoring and monitoring the blended effluent from parallel columns is summarized in the following points may be interpreted as follows.

1. The usage rates decrease as much as 100 percent when the treatment objective is increased from approximately 1.0 to 2.0 mg/L-C.

2. The usage rates for the alum/polymer (Phase I) work are all twenty to forty percent less than the corresponding lime (Phase II) usage rates.

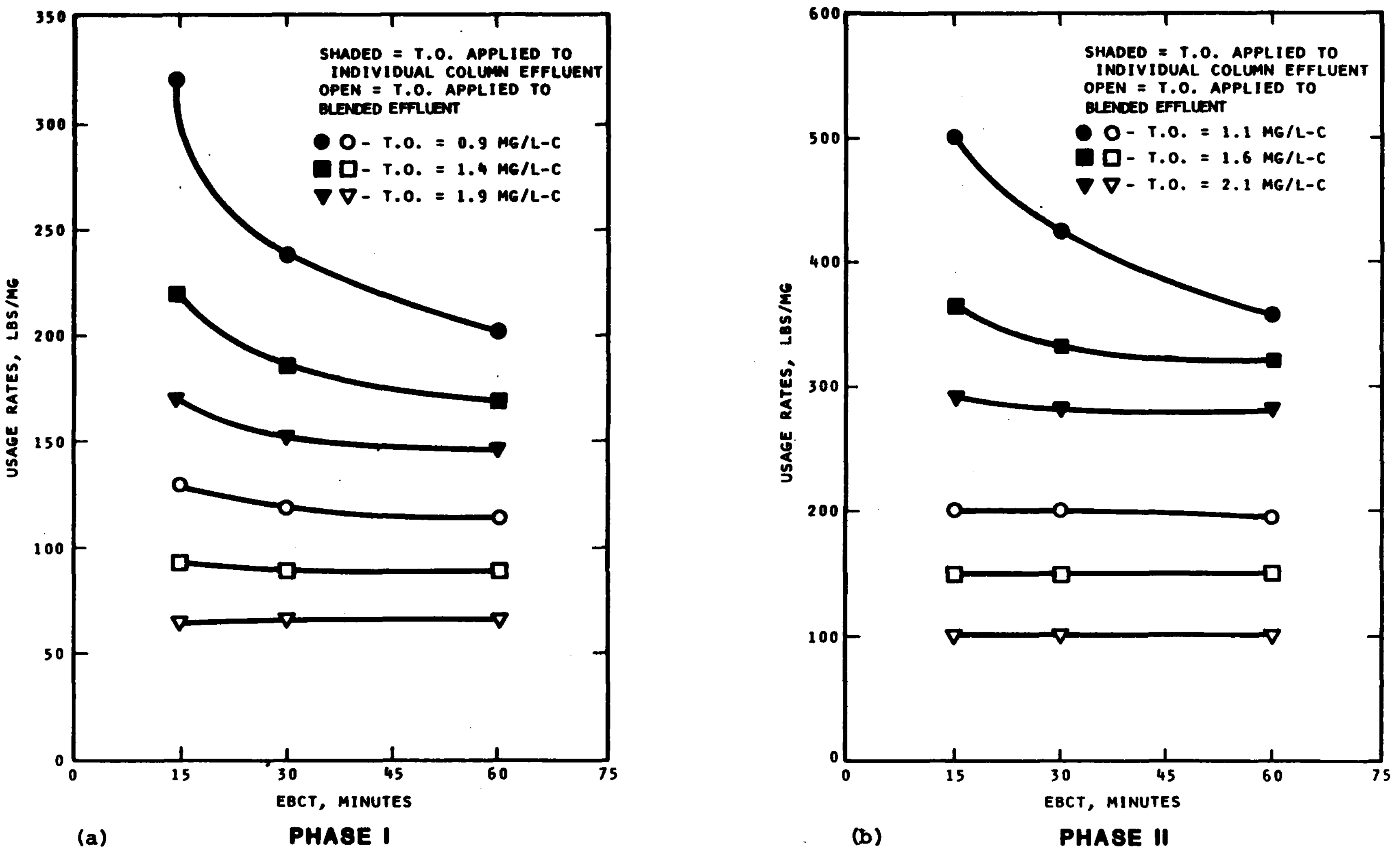
3. For single column effluent monitoring, the usage rates decrease up to 45 percent as the EBCT is increased from 15 to 60 minutes.

4. The usage rates associated with monitoring a single column effluent are two to three times higher than the usage rates of the monitored blended effluent.

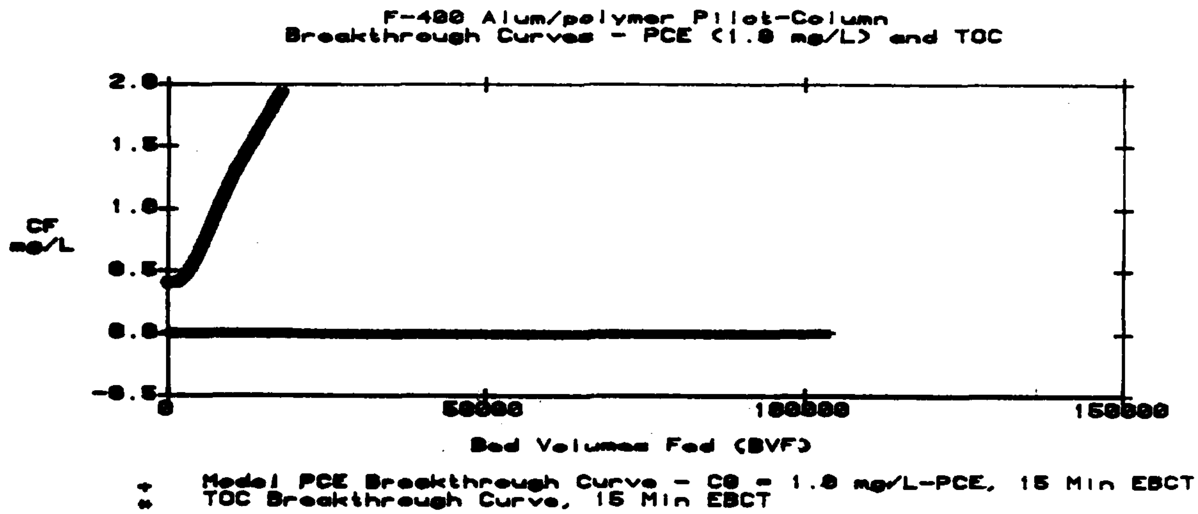
5. Usage rates corresponding to the blended effluent criteria for parallel column operation, do not vary significantly with EBCT. The usage rate decreases by only six percent as the EBCT increases from 15 to 60 minutes. Because the columns are allowed to reach exhaustion prior to regeneration, increasing the EBCT does not significantly decrease the usage rate as it does for the less efficient single column operation.

PCE Breakthrough Curve

As defined in the approach of the GAC study, the modeling and design work were based on TOC adsorption. PCE was selected for an evaluation of the preliminary process design with respect to SOC adsorption. PCE was tested in bench-scale isotherm experiments and a spiking study as previously discussed. Figure I.3-25 is a plot which includes the breakthrough curves for TOC and PCE for a fifteen minute EBCT, 200 MGD GAC process. The breakthrough curves are based on the monitoring of each effluent from the lag columns of 31 parallel sets of contactors. The PCE breakthrough curve is based on an assumed influent concentration of 1 mg/L, which is well above the EEWTP arithmetic mean influent concentration of 1.4 μg/L.



F-400 USAGE RATES
INDIVIDUAL AND 31 PARALLEL COLUMNS
FIGURE I. 3-24



PCE AND TOC BREAKTHROUGH CURVES

F-400

FIGURE I. 3-25

The curves in Figure I.3-25 indicate that even with individual column effluent monitoring and extraordinarily high PCE influent concentration, regeneration of the column based on TOC adsorption would occur before PCE broke through. As a matter of fact, the PCE breakthrough curve indicates that PCE never breaks through the column before any of the selected TOC effluent criteria are met. The results suggest that TOC is a conservative parameter for GAC process design with respect to PCE. Results from the pilot spiking study indicated that TCE, CCl_4, $CHCl_3$, $CHBr_3$, DCBM and DBCM would not desorb from the column when high levels of PCE were in the influent, given the normal influent concentrations of these six additional SOCs. The results from the spiking study, combined with the PCE breakthrough would be conservative with respect to all seven monitored SOCs.

PRELIMINARY DESIGN

The preliminary design work for the 200 MGD GAC facility involved the consideration of both gravity and pressure contactors for 15, 30 and 60 minute EBCTs. To maintain consistency between designs and allow for comparative evaluations to be made, general design constraints were established. Information from EPA (1980), manufacturers of carbon adsorption systems and operating GAC facilities were used in the development of the constraints below.

1. Surface area $\leq$1,000 ft^2, should be constant between EBCT designs.
2. Carbon Depth = 5 to 30 ft.
3. Column Depth = 60 ft, maximum.
4. Loading rate = 2 to 10 gpm/ft^2, selected 5 gpm/ft^2 as a constant.
5. Carbon expansion during backwash = fifty percent.
6. Backwash flowrate = 12 to 20 gpm/ft^2.

Both parallel and in-series operation were considered for the preliminary design. A parallel column operation takes advantage of blending column effluents, as previously discussed.

Two columns in-series provide the additional benefit of having a barrier column, the lag column, which can re-adsorb compounds in case desorption has occurred in the lead column. In a series operation the more exhausted column is in the lead position while the fresher carbon is in the lag position. Based on TOC as the operating parameter, a column may be exhausted with respect to TOC but still have adsorptive capacity for SOCs. The PCE spiking study and modeling work results indicate additional SOC capacity would be available. Therefore, if any compound did desorb from the exhausted column, the fresher lag column would be present as a barrier. Also, if a SOC spill did occur, intermediate sampling at the lead column effluent could be used to determine when the lead column should be taken off line to avoid contamination of the lag column. This operational practice is more economical because only half the carbon must be removed for regeneration.

The final design for both gravity and pressure contactors incorporates 64 GAC contactors with two in-series, 31 in parallel and two stand-by columns. Eight banks of eight contactors each are arranged with 32 on a side separated by the

main influent and effluent lines. Table I.3-4 summarizes the primary design parameters for each of the columns in the two stage gravity and pressure GAC processes.

TABLE I 3-4

DESIGN PARAMETERS FOR TWO STAGE IN PARALLEL GAC OPERATION

EBCT min.	Surface Area m^2 (ft^2)	Loading Rate $l/sec\text{-}m^2$ (gpm/ft^2)	Carbon Depth m (ft)	Contactor[1] Depth m (ft)	Length m (ft)	Width m (ft)
Gravity						
15	62.8 (900)[2]	3.4 (5)	1.3 (5)	3.7 (14)	5.3 (20)	11.9 (45)
30	62.8 (900)	3.4 (5)	2.6 (10)	5.8 (22)	5.3 (20)	11.9 (45)
60	62.8 (900)	3.4 (5)	5.3 (20)	10.0 (38)	5.3 (20)	11.9 (45)
Pressure					Diameter, m(ft.)	
15	62.8 (900)	3.4 (5)	1.3 (5)	3.7 (14)	90.0 (34)	
30	62.8 (900)	3.4 (5)	2.6 (10)	5.8 (22)	9.0 (34)	
60	62.8 (900)	3.4 (5)	5.3 (20)	10 (38)	9.0 (34)	

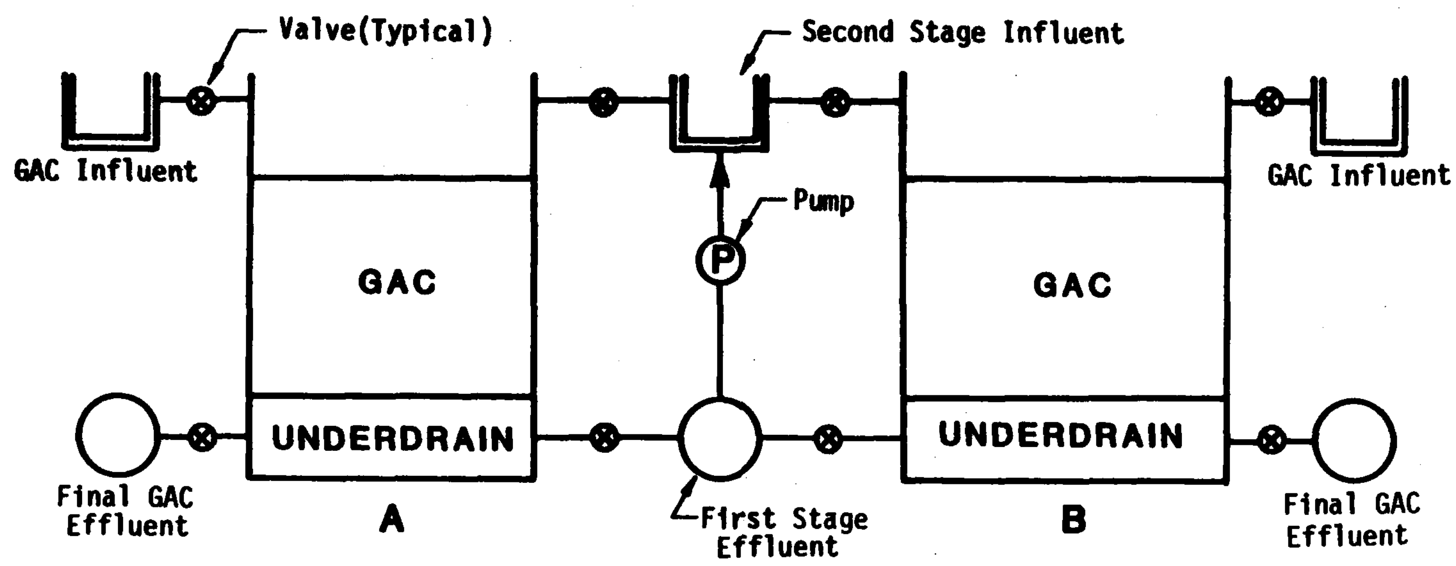
1. Column Depth - Carbon depth + 50% expansion + 0.53 m (2 ft.) (Leopold Blocks & Gravel) + 0.26 m (1.5 ft.) (troughs) + 0.79 m (3 ft.) (freeboard).
2. Large cross-sectional area used because of expected number of tanks, i.e., least cost anticipated to correspond to fewer, larger tanks.

Individual gravity contactors are based on conventional constant-rate gravity filter design. Gravity contactor design incorporate the parallel/series design configuration used in Andijk, Nord Holland, The Netherlands. The design allows each column to be utilized as either a lead or a lag column providing operational flexibility. Similar flexibility was incorporated for the pressure contactor configuration. Figures I.3-26 and I.3-27 are sketches of the gravity and pressure contactor GAC processes, respectively.

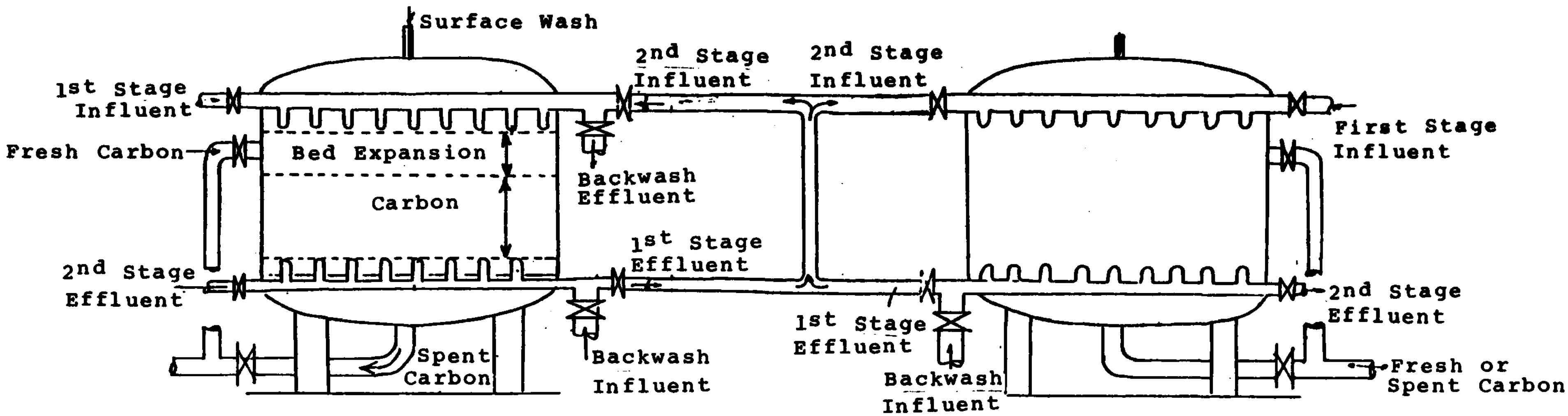
GAC FACILITY COSTS

GAC Process

Costs for the GAC processes, gravity and pressure, were developed using information obtained from EPA, manufacturers and contractors. The costs are based on 64 contactors, including backwash facilities which could service two columns simultaneously. Table I.3-5 summarizes the costs for each preliminary GAC process design. Costs reflect construction cost only, and do not include contractor's overhead and profit, administration, legal or engineering costs.



TWO GRAVITY CONTACTORS IN SERIES
FIGURE I. 3-26



TWO GAC PRESSURE CONTACTORS IN SERIES
FIGURE I. 3-27

Land costs are also not included. Prices are based on April 1983 dollars. Further details of cost assumptions are provided in Chapter 11.

A comparison of the design costs reveals that the pressure contactor design is approximately 22 percent more expensive than the gravity contactors. The increase in capital cost is due solely to the costs associated with the steel contactors.

TABLE I 3-5

CARBON CONTACTOR COST ESTIMATES
$ x 1,000

Option A. Two-Stage Gravity Contactor

Items	EBCT, min 15	30	60
Excavation	182	238	307
Manuf. Equip.	4,038	5,265	6,818
Concrete/Steel	2,056	2,679	3,461
Labor	4,349	5,670	7,342
Pipe/Valves	5,385	7,020	9,090
Elect/Inst.	1,097	1,431	1,858
Buildings	3,603	4,698	6,087
Carbon	6,830	12,800	23,840
Backwash	500	530	630
Total	$24,040	40,331	59,483

Option B. Two-Stage Steel Pressure Contactors

Items	EBCT 15	30	60
Excavation	41	48	64
Manuf. Equip.	13,775	17,972	23,818
Concrete/Steel	308	341	453
Labor	1,865	1,990	2,153
Pipe/Valves	4,850	5,668	7,512
Elect/Inst.	2,061	2,247	2,963
Buildings	3,650	6,296	8,840
Carbon	6,830	12,800	23,890
Backwash	500	530	630
Total	$33,880	47,892	70,323

Regeneration Costs

Regeneration costs were developed for a multiple-hearth furnace (MHF) using EPA and manufacturers information. Figure I.3-28 contains both construction and O&M costs for a MHF based on usage rate. Table I.3-6 summarizes the regeneration capital costs associated with each EBCT and T.O. combination considered for the 31 parallel column sets in the modeling section (cost information from Figure I.3-26 was used).

TABLE I.3-6

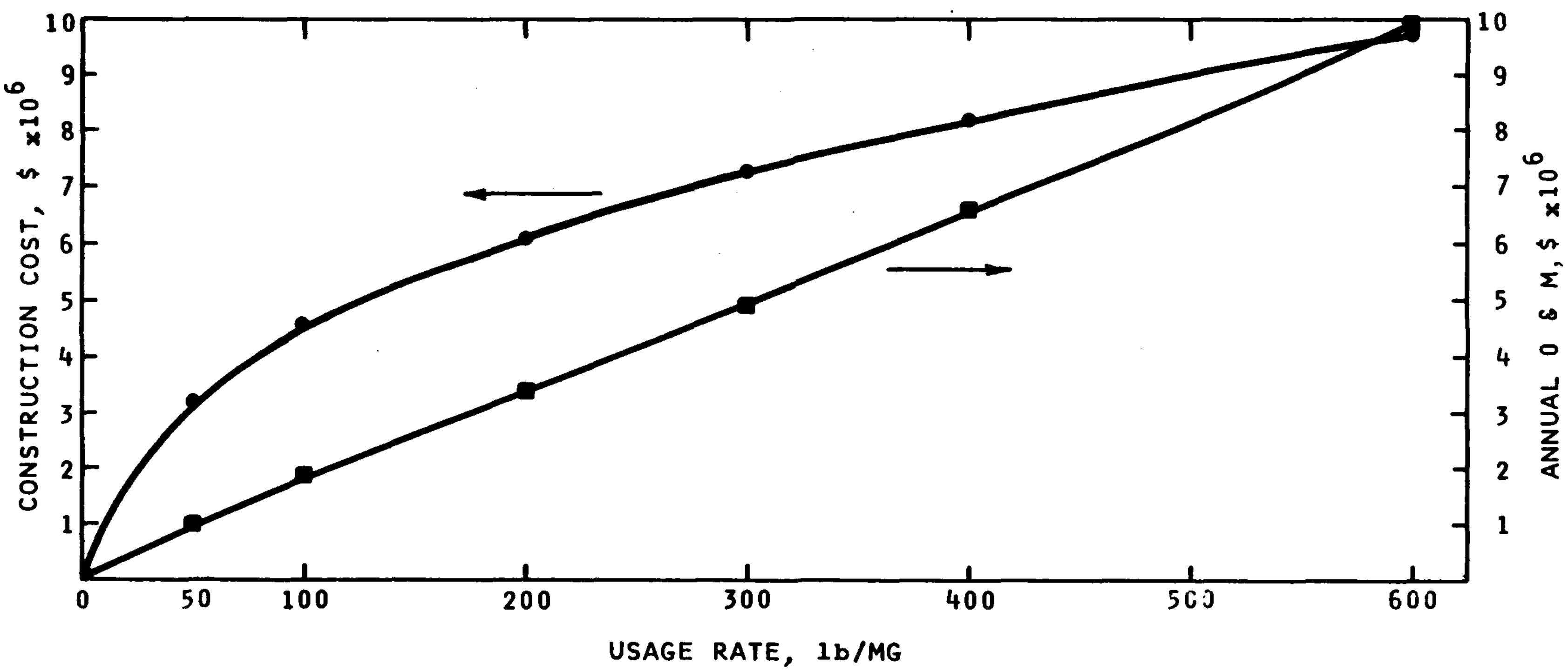
GAC REGENERATION CAPITAL COSTS[1]
MULTIPLE HEARTH FURNACE

EBCT Minutes	Phase I $ x 10^6	Phase II $ x 10^6
15		
$T.O._1$	5.1	6.2
$T.O._2$	4.4	5.4
$T.O._3$	3.7	4.6
30		
$T.O._1$	4.9	6.2
$T.O._2$	4.3	5.3
$T.O._3$	3.7	4.6
60		
$T.O._1$	4.8	6.2
$T.O._2$	4.3	5.3
$T.O._3$	3.7	4.6

1. The costs were determined using the usage rates, lbs/MG, calculated for the two columns in series/31 in parallel, see Figure I.3-23. The costs reflect construction costs only and do not incude sitework, contractor overhead and profit, engineering, legal, fiscal, administrative, and contingency costs.

Total Costs

Total cost calculations were computed to provide monetary information for comparative purposes. Because a) the capital and O&M costs associated with regeneration are exactly the same for both gravity and pressure contactor designs, b) the capital costs for the gravity design are approximately 22 percent less than the pressure designs, and c) the general trends resulting from the total cost comparisons of both gravity and pressure designs will be the same, total



GAC REGENERATION COSTS
MULTIPLE HEARTH FURNACE
FIGURE I. 3-28

costs were determined only for the gravity designs. Cost information from three sources was used in the calculations as listed below.

1. Chapter 11, Section 5, Table 11.5-3 was used for the GAC process O&M costs.

2. Table I.3-5 was used for GAC process capital costs.

3. Figure I.3-28 was used for both capital and O&M costs for the multiple hearth furnace, carbon regeneration process.

Figure I.3-29 is a graphical summary of the total costs for the gravity contactor design for Phases I and II. The capital costs were amortized over a 20 year duration at eight percent. Regeneration costs were based on the usage rates associated with the F-400 carbon. The curves in Figure I.3-29 indicate that the total costs associated with the Phase I operation are 10 to 15 percent less than the Phase II costs. This difference is due solely to the regeneration costs which comprise thirty to forty percent of the total costs.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions derived from the GAC study are listed below.

1. The pretreated waters of both Phase I and Phase II contain a non-adsorbed fraction of TOC.

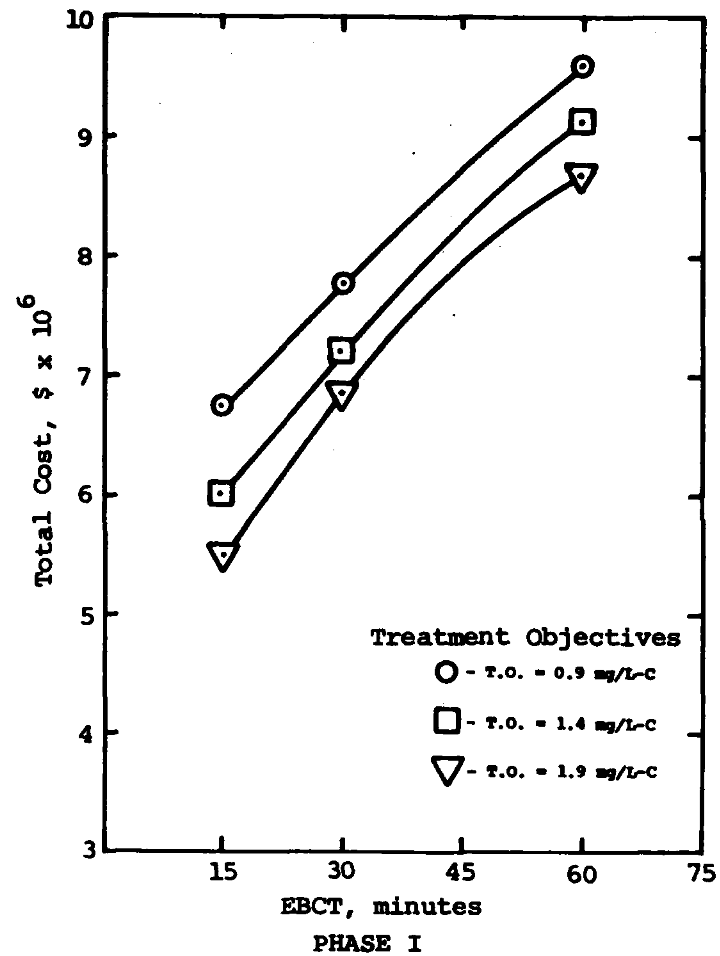
2. Modeling of a TOC breakthrough curve using the adsorption parameters, K, 1/n, k_f, D_s and C_x, determined from bench- and pilot-scale work was successfully verified with plant-scale data.

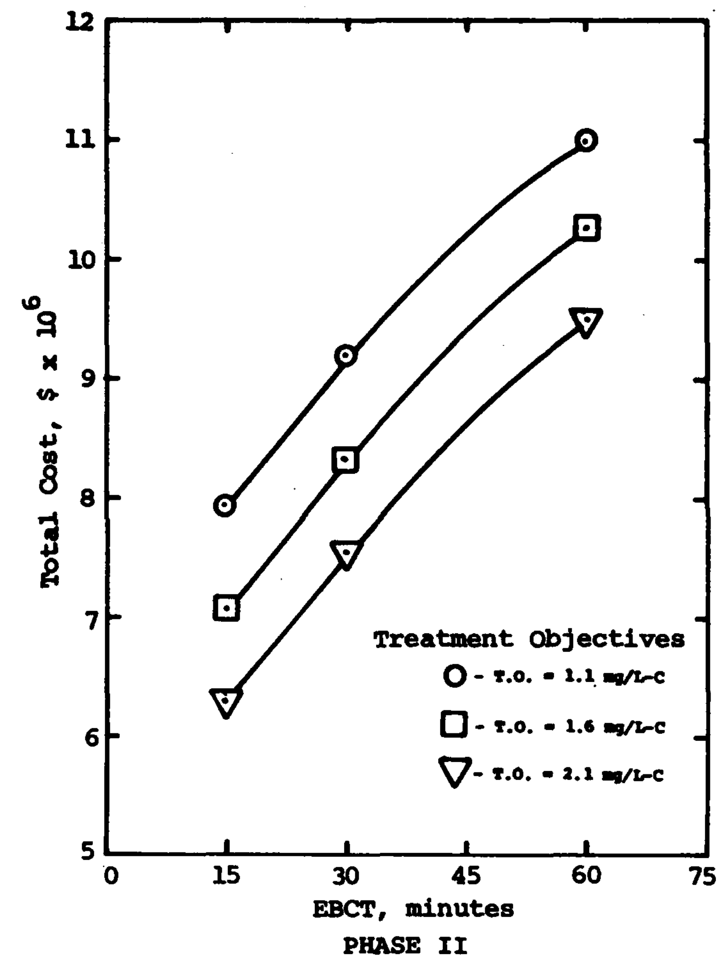
3. Operation of the GAC process with respect to TOC removal is a conservative approach for seven monitored SOCs, according to the results of the PCE spiking study and modeling work.

4. A GAC process design configuration which incorporates both in-series and in-parallel operation allows for intermediate monitoring to evaluate desorption and carbon exhaustion with respect to organic compounds and utilizes the carbon more efficiently, to exhaustion, respectively.

5. Longer empty bed contact times (EBCT) lead to more efficient use of the carbon, and lower carbon usage rates, only when considering effluent criteria for a single column. With many columns operating in parallel and regeneration criteria applied to the blended effluent, longer EBCTs are no longer cost effective.

6. Effluent criteria for column regeneration are most efficiently and economically met when the blended effluent from the 31 parallel columns is monitored as opposed to the effluent from each column.





TOTAL COSTS 200 MGD GAC PROCESS AND REGENERATION FACILITY F-400 CARBON USED

FIGURE I. 3-29

7. The usage rates corresponding to the Phase I operation were estimated to be 20 to 40 percent less than Phase II due to the difference in determined model parameters associated with the pilot column calibration. These lower usage rates lead to lower estimated GAC process costs for the Phase I process.

Based upon the above conclusions, several general recommendations can be made.

1. Modeling the GAC process is a useful tool which is recommended for use in the evaluation of potential process designs under any selected influent conditions.

2. Based on the results of the GAC study, TOC is a conservative parameter; information pertaining to TOC adsorption can be used to develop a design which will effectively remove organic contaminants.

3. A GAC process design should include both in-series and in-parallel operation to provide operational flexibility and efficient and economical use of the carbon.

4. According to the usage rates determined from the GAC study, longer empty bed contact times (greater than fifteen minutes) are warranted only if the effluents from individual contactors are being monitored. Regeneration criteria based on the blended effluent from many contactors lead to efficient use of all of the GAC, such that longer EBCTs are not cost effective. This was true for all treatment objectives examined in this study (1.0, 1.5 and 2.0 mg/L TOC). An EBCT of fifteen minutes is therefore recommended for full scale application.

5. Selection of TOC effluent criteria for carbon regeneration is difficult because TOC levels do not correlate with potential health effects to consumers. Because of the contaminated source, it is recommended that a criterion of 1 mg/L TOC (the lowest criterion evaluated) be assumed when considering the blended effluent from many columns operated in parallel. Selection of a low TOC value is more conservative and provides a greater degree of protection to consumers, but at an increase in cost. GAC operating costs with the 1 mg/L TOC criterion are still lower than those generated on the basis of the EEWTP single column experience, as discussed in Chapter 11.

TABLE I.3-7

EQUILIBRIUM ISOTHERM EXPERIMENTAL PROCEDURE

Measurements:

1. Initial - pH, turbidity, TOC, LLE, TOX, temperature
   DO, Cl_2 residual (free and total), UV at 254 nm for TOC isotherm test only

2. Final - TOC or LLE, temperature, pH, UV at 254 nm for TOC isotherm test only

Sample Preparation:

1. The TOC and TOX samples are collected in 60 ml and 250 ml bottles, respectively. The bottles were prepped with $NaSO_3$ and H_2SO_4. $NaSO_3$ is used to control THM formation and/or quenches any free chlorine residual present. H_2SO_4 addition controls biological growth by pH reduction and, in the case of TOC, the lower pH precipitates inorganic TOC. The samples are stored in a refrigerator at 4°C until analyzed.

2. LLE sample bottles are prepped with $NaSO_3$ to control THM formation in the event there is a free Cl_2 residual in the sample. For sample collection 17 ml bottles are used.

Experimental Plan[1]:

1. A representative sample of the carbon in the manufacturer's bag should be obtained. If possible, the contents of the bag ought to be processed through a sample splitter. As the carbon passes through the splitter, a portion is composited as a representative sample. Before equipment is used, make sure it is properly cleaned, see Step 5.

2. Prepare carbon for study so that it reflects the conditioning applied to the pilot column carbons.

   a. Backwash each carbon to remove the fines using city water, expanding the bed 30%, and backwashing for thirty minutes.

   b. Dry carbon at 105°C overnight in glass beakers and store in amber-colored, borosillicate glass bottles, airtight, and in the dark when not using.

   c. Working carbon should be kept in a dessicator

3. Crushing of carbon

   a. Using a ball mill, crush the carbon. Generally, the ball mill will crush all the carbon. If necessary, pass uncrushed carbon through a second time.

TABLE I.3-7 (Continued)

EQUILIBRIUM ISOTHERM EXPERIMENTAL PROCEDURE

b. Store the crushed carbon in a dessicator or airtight container until it can be sieved.

c. Using 200 and 325 mesh screens, rho-tap the crushed carbon with an automatic sieving device. The 200 mesh insures the particles are small enough so that the compound of interest is readily adsorbed. The 325 mesh insures the particles are not too small and can be centrifuged down, out of the water column in the test bottles.

d. If the carbon needs to be crushed some more to pass the 200 mesh screen, repeat "a" through "c".

e. The carbon which passs the 200 but not the 325 mesh screen is used for the isotherm studies.

f. Store working isotherm carbon in dessicator until use and non-working PGAC in airtight, amber colored, borosillicate, 4L jugs in the dark until use.

4. Cut teflon discs to fit the tops of the centrifuge bottles. These teflon inserts provide an airtight seal and a barrier between the polyethylene screw cap and the experimental water.

5. Preparation of isotherm equipment - all equipment coming in contact with the PGAC or test water should be cleaned by the following technique.

a. Using micro, a laboratory detergent which does not contain phosphates and/or leave a residue, wash all equipment thoroughly.

b. Rinse with Milli-Q water at least three times. The Milli-Q system polishes our deionized water by:
i. An activated adsorption cartridge removes dissolved organics.
ii. Two ion-exchange cartridges remove ionized inorganics.
iii. A millipore membrane removes all micro-organisms greater than 0.22 μm.

c. All glassware except the centrifuge bottles should be baked for one hour at 250°F or, if possible, muffled at 400°F for one hour.

d. All teflon,[2] brass screens,[3] and centrifuge bottles should be dried overnight at 105°F.

e. Store all equipment in designated cabinets. Cap all bottles before storage.

TABLE I.3-7 (Continued)

EQUILIBRIUM ISOTHERM EXPERIMENTAL PROCEDURE

6. **Standard Isotherm Test Procedure**

   a. All equipment is to be prepared as discussed in Step 5.

   b. Collect a water sample from the filter effluent clearwell in a five gallon glass carboy. When collecting water for testing volatiles, allow the flow to travel down the inside of the carboy to avoid excessive disturbance. If the water surface is overly disturbed during collection, volatiles will be lost to the atmosphere, stripped off. This loss of volatiles should be considered if the sample water is not going to be spiked.

   c. Measure the free chlorine residual of the water collected. If a residual is present then quench it with $NaSO_3$. The free chlorine may interact with the organic material and/or the chemical compounds affecting the adsorption process. Dechlorination occurs within the first few inches of GAC in a column; therefore, a free chlorine residual is not encountered by the bulk of the GAC in a column. The quenching of it during experimentation is justified.

   d. For tests conducted to evaluate TOC adsorption, place the glass carboy on a magnetic stirer and using a teflon stir bar, mix the water sample; do not mix vigorously. Allow the water to attain the temperature under which the test will be conducted.

   e. For tests conducted to evaluate LLE adsorption, without spiking the sample water, place glass carboy on the counter. Let stand undisturbed until the temperature of the water is equivalent to the temperature of the area where the tests will be conducted. Never mix or disturb the sample water while preparing the isotherm bottles.

   f. For tests conducted to evaluate LLE adsorption with spiked sample water, add the spiking solution during this step. First allow the sample water to attain the temperature under which the test will be conducted. Next, add the spiking solution allowing it to flow down the carboy's walls. Very slowly mix the contents of the carboy with a magnetic stirrer and teflon bar. Let mix for five minutes and then stop.

   g. Take initial measurements, see "Measurements" section.

   h. Weigh out varying amounts of PGAC (at least ten different weights) and add to each of the centrifuge bottles, up to 24 bottles. Be sure to cap each bottle after PGAC addition to avoid accidental spills. Also, label each bottle with PGAC type, weight, time and date.

TABLE I.3-7 (Continued)

EQUILIBRIUM ISOTHERM EXPERIMENTAL PROCEDURE

i. Add water sample to each bottle but do not fill.

j. Allow the mixture to stand five minutes so the PGAC will become saturated with water.

k. Fill each centrifuge bottle and cap with teflon disc and screw top.

l. Check to insure that air bubbles are minimal for TOC test and non-existant for SOC test and each top is securely tightened.

m. Place bottles into the isotherm rotational device boxes so they will be rotated end on end. Note the location of each bottle.

n. Rotate the bottles at 24 rpm for six days unless otherwise specified.

o. Remove the bottles, four at a time, and centrifuge at 2,200 rpm for ten to twenty minutes. If necessary a pressure filtration device may be required to remove the PGAC fines before the TOC sample is taken.

p. Once all the bottles have been centrifuged a sample for TOC/UV at 254 nm or LLE measurement should be taken from each bottle as follows.
   i. Unscrew the top but do not remove.
   ii. Lift the top at an angle just enough to allow for the use of a pipet.
   iii. Pipet approximately one half inch below the water surface; 15 ml for TOC and 25 ml for LLE.
   iv. Transfer pipetted sample to the prepared TOC or LLE sample bottles, see "Sample Preparation" section.
   v. Sample for UV absorbance when necessary and conduct analysis immediately.

---

1. Temperature and pH control will not be addressed by this experimental plan.
2. Tygon tubing should never be used in place of teflon tubing because tygon leaches pthalates and promotes biological growth.
3. Never use brass in contact with water and carbon simultaneously; a very corrosive reaction occurs.

TABLE I.3-8

DIFFERENTIAL COLUMN RATE STUDY EXPERIMENTAL PROCEDURE

Measurements:

1. Initial and Final - pH, turbidity, TOC, LLE, TOX, temperature, DO, Cl_2 residual (free and total), UV absorbance at 254 nm for TOC rate test only.

2. During Test - UV at 254 nm or LLE

Sample Preparation:

1. The TOC and TOX samples are collected in 60 ml and 250 ml bottles, respectively. The bottles were prepped with $NaSo_3$ and H_2SO_4. $NaSO_3$ is used to control THM formation and/or quenches any free chlorine residual present. H_2SO_4 addition controls biological growth by pH reduction and, in the case of TOC, the lower pH precipitates inorganic TOC. The samples are stored in a refrigerator at 4°C until analyzed.

2. LLE samples are quenched with $NaSO_3$ to control THM formation in the event there is a free chlorine residual in the sample. $NaSO_3$ are added to each bottle prior to sample collection. 17 ml bottles are used for sample collection.

Experimental Plan:[1]

1. Prepare the carbon for the study so that it reflects the conditioning applied to the pilot column carbons.
   a. Backwash each carbon to remove the fines using city water, expanding the bed 30%, and backwashing for thirty minutes.

   b. Dry the carbon at 105°C overnight in glass beakers and store in airtight amber colored, borosilicate glass bottles, in the dark, until use.

   c. Working carbon should be kept in a dessicator.

   d. The preparation should be completed before the equilibrium iosotherm test so carbon from the same backwashed stock can be used in both tests.

2. Preparation of Rate Studies Equipment - all equipment which comes in contact with the GAC or the test water should be cleaned by the following technique.

   a. Using micro, a laboratory detergent which does not contain phosphates and/or leave a residue, wash all equipment thoroughly.

TABLE I.3-8 (Continued)

DIFFERENTIAL COLUMN RATE STUDY EXPERIMENTAL PROCEDURE

b. Rinse with Milli-Q water several times. The Milli-Q system polishes a deionized water source in a three step process.
   i. An activated adsorption cartridge removes dissolved organics.
   ii. Two ion-exchange cartridges remove ionized inorganics.
   iii. A millipore membrane removes all micro-organisms greater than 0.22 μm.

c. All glassware used when TOC adsorption is being evaluated should be rinsed twice more with Milli-Q and placed in a 105°F oven overnight. Glassware openings, and teflon pieces should be covered with foil before placement in the oven.

d. All glassware used for volatile adsorption evaluation, should either be rinsed a second time and baked for one hour at 250°F or muffled at 400°F for one hour.

e. All teflon and stainless steel should be rinsed several times with Milli-Q and dried overnight at 105°F. Make sure the teflon tubing is thoroughly rinsed inside before placing in oven.

f. Cap all bottles before storage.

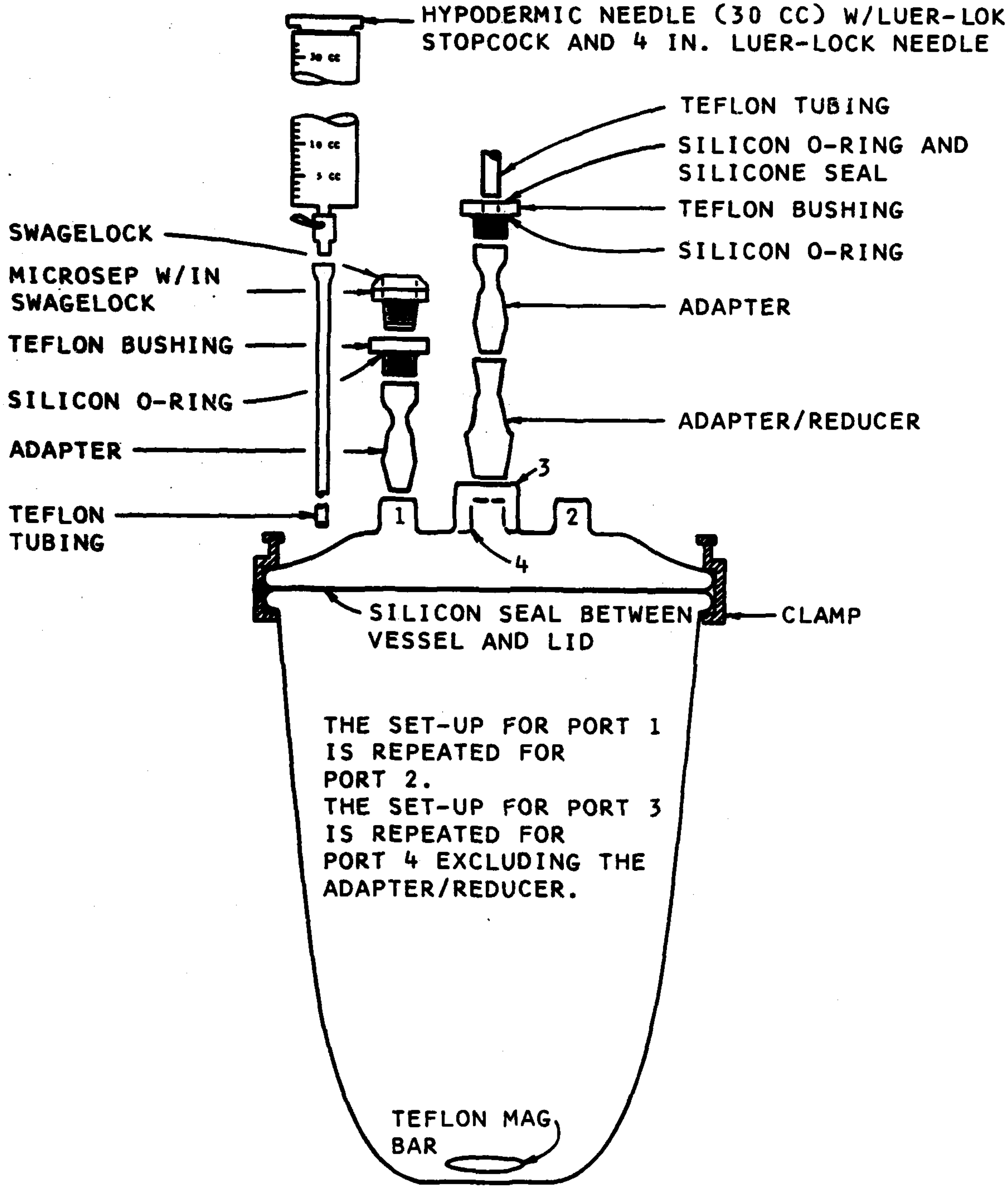
3. Set-up the rate test equipment

   a. See Figure I.3-30 for rate test reservoir sketch.

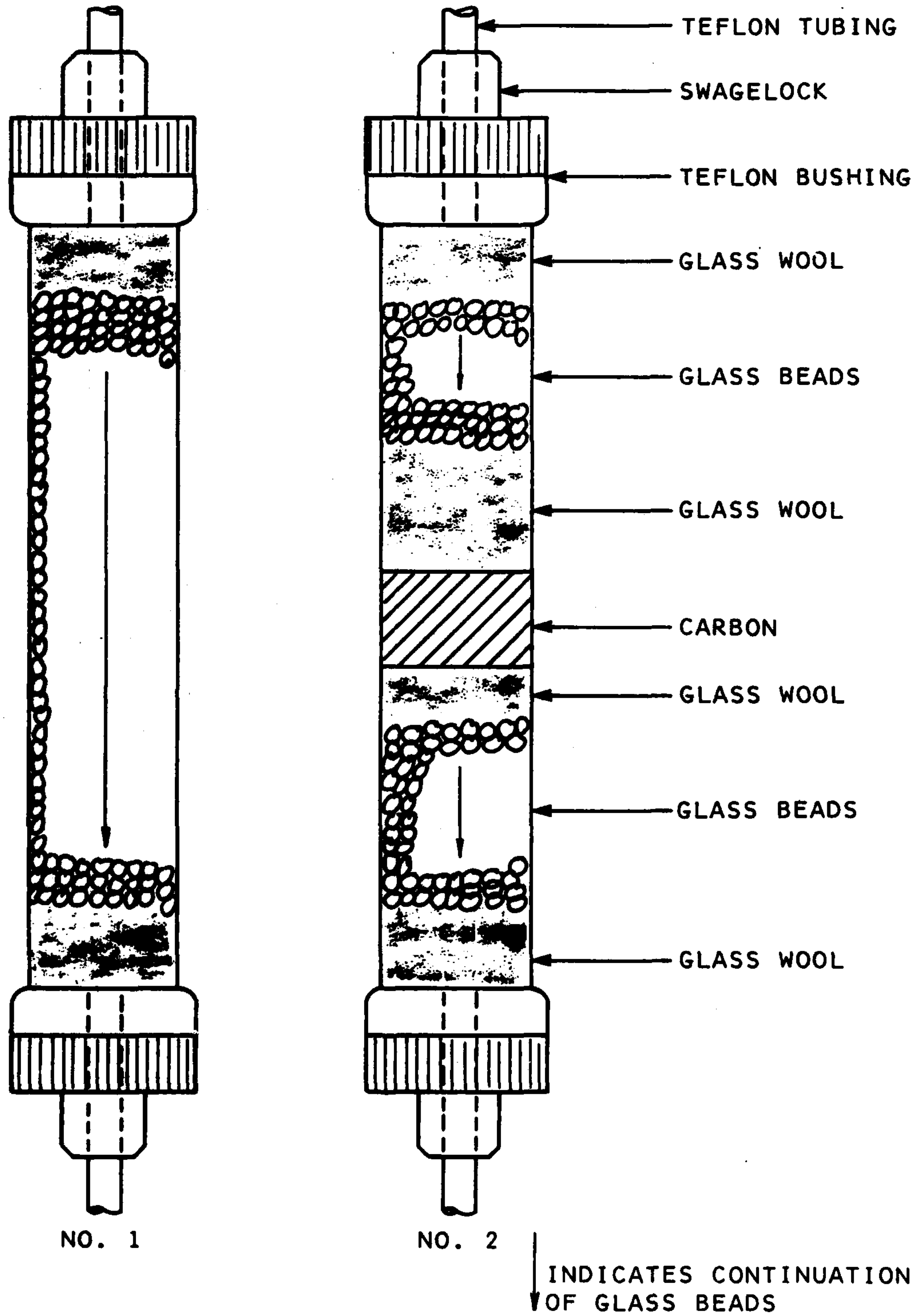
   b. Column selection, 14 or 26 mm, based on the following.
      i. Sample calculations for carbon mesh (12x40) which consider channelling and wall effects.
      ii. Mass of carbon used should be capable of reducing the concentration of the measured organic material or compounds by 50%. The depth of carbon should be at least five to ten particle diameters deep.
      iii. Headloss thru the column, the larger the diameter, the lower the headloss. Generally, the 14 mm diameter columns are used.

   c. Refer to Figure I.3-31 for differential column packing procedure.

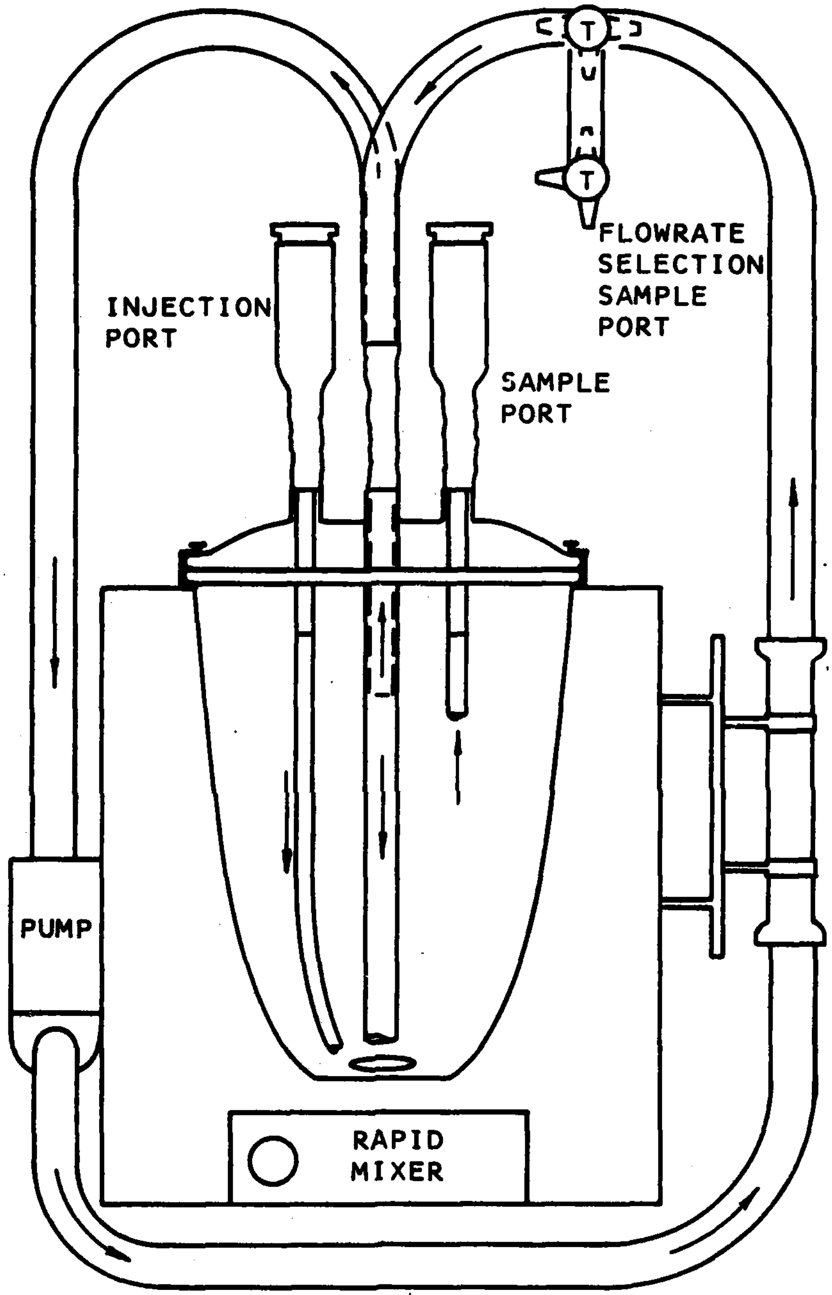
   d. Connect teflon tubing as indicated in Figure I.3-32.



DIFFERENTIAL COLUMN STUDY
REACTION KETTLE
FIGURE I. 3-30



DIFFERENTIAL COLUMNS PACKING PROCEDURE
FIGURE I. 3-31



DIFFERENTIAL COLUMN STUDY
TEFLON TUBING LAYOUT
FIGURE I. 3-32

TABLE I.3-8 (Continued)

DIFFERENTIAL COLUMN RATE STUDY EXPERIMENTAL PROCEDURE

4. Standard Rate Test Procedure

a. Durration Determination.

i. Conduct a sieve analysis of carbon.

ii. Plot D_p, the particle diamter, versus probability. If the sieve analysis data are widely scattered, plot the data as ln D_p versus probability.

iii. The value of D_p at the 50% probability of occurrance is equivalent to twice the mean particle radius, R. This D_p value is important for both the model calculations and standard rate test.

iv. For TOC assume $2 \times 10^{-3} < \bar{t} < 2 \times 10^{-1}$

HD4000	**5.8×10^{-11} cm^2/sec**
F400	**1.7×10^{-11} cm^2/sec**
WVG	**2.1×10^{-11} cm^2/sec**

(D_s values are based on results in the Lee <u>et al</u> paper, Table 3)

v. For LLE assume $1.5 \times 10^{-3} < \bar{t} < 2 \times 10^{-1}$ and $1.5 \times 10^{-10} \leq D_s \leq 3 \times 10^{-10}$ cm^2/sec.

vi. Solve the following equation for t.

$$t = \frac{\bar{t}R^2}{D_s}$$

vii. Use the lower value of t for the test duration without going beyond a 14 day duration.

b. All equipment is to be prepared according to Step 2.

c. Collect a water sample from the filter effluent clearwell in a five gallon glass carboy. When collecting water for testing volatiles, allow the flow to travel down the inside of the carboy to avoid excessive disturbance. If the water surface is overly disturbed during collection, volatiles will be lost to the atmosphere; stripped off. This loss of volatiles should be considered if the sample water is not going to be spiked.

TABLE I.3-8 (Continued)

DIFFERENTIAL COLUMN RATE STUDY EXPERIMENTAL PROCEDURE

d. Measure the free chlorine redisual of the water collected. If a residual is present, quench it with $NaSO_3$. The free chlorine residual may interact with the organic material and/or the chemical compounds affecting the adsorption process. Dechlorination occurs within the first few inches of GAC in a column; therefore, a free chlorine residual is not encountered by the bulk of the GAC in a column. The quenching of it during experimentation is justified.

e. For tests conducted to evaluate TOC adsorption, place the glass carboy on a magnetic stirrer and using a teflon stir bar, mix the water sample; do not mix vigorously. Allow the water to attain the temperature under which the test will be conducted.

f. For tests conducted to evaluate LLE adsorption, without spiking the sample water, place glass carboy on the counter. Let stand undisturbed until the temperature of the water is equivalent to the temperature of the area where the tests will be conducted. Never mix the sample water while preparing the rate test.

g. Collect samples and take measurements as defined under "Measurements" so the filter influent can be characterized accurately.

h. Volume Determination.
   i. Keeping track of the volume used, fill up the rate test set-up with the filter effluent.
   ii. Check to be sure the system is headspace free for LLE rate test only.

i. Replace differential column 1 with column 2 and check for headspace free condition, if necessary. The volume of water which might possibly be lost during transfer has already been accounted; therefore, it is unnecessary to record any additional volume required. If desired, the volumes of each column could be checked at the end of the experiment.

j. For LLE adsorption experiments, if a spiked sample is desired, then the sample water should be spiked at this point. Add the spiking water through the luer-lock injection port. Follow points a through e of substep m.iv, except the volume of Milli-Q will be replaced by the volume of spiking solution.

TABLE I.3-8 (Continued)

DIFFERENTIAL COLUMN RATE STUDY EXPERIMENTAL PROCEDURE

k. Flowrate Selection
   i. Turn on the pump and set the flowrate at 2.5 ml/sec.
   ii. Let run for a few minutes.
   iii. Collect an influent and effluent sample from the glass carbon column and analyze. Utilize UV absorbance at 254 nm as a surrogate measure for immediate TOC analysis. Analyze collected TOC samples as soon as possible. LLEs will have to be run immediately after collection.
   iv. If the concentrations are equivalent, then use this flowrate during tests.
   v. If the concentrations are not equal, then increase flowrate and repeat above steps.

l. Once flowrate is established, leave pump setting at this rate for the duration of the test.

m. Sample collection - when a sample is taken, the exact volume removed should be replaced by an equivalent volume of Milli-Q water to maintain the no head space condition.
   i. Collection of the samples will take place over a pre-determined duration.
   ii. In order to abide by the 5% total volume sampled rule, thirteen TOC samples at 15 ml or ten LLE samples at 20 ml can be taken.
   iii. Figure I.3-32 shows the injection and sample ports. Remember to keep the luer-locks closed when not sampling.
   iv. For a UV sample:
      a) Pour 15 ml of Milli-Q into the injection port.
      b) Open sample port luer-lock.
      c) Open injection port luer-lock and depress plunger.
      d) The injected Milli-Q should deplace a 15 ml sample of the test water into the sample port.
      e) Close both luer-locks.
      f) Remove sample port from needle and analyze for UV absorbance at 254 nm.
      g) Return sample port to rate test set-up.
   v. For a LLE sample follow iv using a 20 ml volume. Samples are to be refrigerated at 4°C until analyzed.

n. After the last rate study sample, collect samples and take measurements of the parameters indicated under "Measurements".

---

1. Temperature and pH control will not be addressed by this experimental plan.

TABLE I.3-9

MINI-COLUMN EXPERIMENTAL PROCEDURE

Measurements:

1. Initial - pH, turbidity, TOC, LLE, TOX, temperature, DO, Cl_2 residual (free and total), alkalinity

2. During Test - TOC

Sample Preparation:

1. The TOC and TOX samples are collected in 60 ml and 250 ml bottles, respectively. The bottles were prepped with $NaSO_3$ and H_2SO_4. $NaSO_3$ is used to control THM formation and/or quenches any free chlorine residual present. H_2SO_4 addition controls biological growth by pH reduction and, in the case of TOC, the lower pH precipitates inorganic TOC. The samples are stored in a refrigerator at 4°C until analyzed.

2. LLE samples are quenched with $NaSO_3$ to control THM formation in the event there is a free chlorine residual in the sample. $NaSO_3$ is added to each bottle prior to sample collection. 60 ml bottles are used for sample collection.

Experimental Plan:[1]

1. Prepare the carbon for the study so that it reflects the conditioning applied to the pilot column carbons.

   a. Backwash each carbon to remove the fines using city water, expanding the bed 30%, and backwashing for thirty minutes.

   b. Dry the carbon at 105°C overnight in glass beakers and store in airtight amber-colored, borosilicate glass bottles in the dark until use.

   c. Working carbon should be kept in a dessicator.

   d. The preparation should be completed before the equilibrium isotherm and rate tests so carbon from the same backwashed stock can be used for all tests.

2. Preparation of Mini-Column Experimental Equipment - all equipment which comes in contact with the GAC or the test water should be cleaned by the following technique.

TABLE I.3-9 (Continued)

MINI-COLUMN EXPERIMENTAL PROCEDURE

a. Using micro, a laboratory detergent which does not contain phosphates and/or leave a residue, wash all equipment thoroughly.

b. Rinse with Milli-Q water several times. The Milli-Q system polishes a deionized water source in a three step process.
   i. An activated adsorption cartridge removes dissolved organics.
   ii. Two ion-exchange cartridges remove ionized inorganics.
   iii. A millipore membrane removes all micro-organisms greater than 0.22 µm.

c. All glassware used when TOC adsorption is being evaluated should be rinsed twice more with Milli-Q and placed in a 105°F oven overnight. Glassware openings, and teflon pieces should be covered with foil before placement in the oven.

d. All glassware used for volatile adsorption evaluation, should either be rinsed a second time and baked for one hour at 250°F or muffled at 400°F for one hour.

e. All teflon and stainless steel should be rinsed several times with Milli-Q and dried overnight at 105°F. Make sure the teflon tubing is thoroughly rinsed inside before placing in oven.

f. Cap all bottles before storage.

3. Set-up mini-column equipment

a. Pack 26 mm glass column
   i. Attach teflon tubing and swagelocks to mini-column.
   ii. Pour Milli-Q water into empty column till 1/3 full.
   iii. See Figure I.3-31 for placement of glass wool, glass beads and GAC.
   iv. Carbon depth in column should be at least 10 cm (4 in.).
   v. Be certain to weight carbon before packing column.
   vi. Make sure the carbon and glass wool interfaces are level to avoid channeling and poor flow distribution.
   vii. Continue to add water to column while packing. This helps to ensure the column will be tightly packed.
   viii. Once completed, connect column and tubing to pump.

b. Transport mini-column, pump, and two five gallon glass carboys to the reservoir tank containing a continuously replenished supply of filter effluent.

TABLE I.3-9 (Continued)

MINI-COLUMN EXPERIMENTAL PROCEDURE

c. Collect initial samples for analyses as indicated under "Measurement".

d. Turn on pump to the correct pump setting; allow filter effluent to completely displace water in column, and immediately begin to sample.

e. Continue to sample over a 24-hour period sampling frequently at first and ending with samples at two hour intervals.

f. Remember to composite filter effluent water in both carboys throughout the 24 hours.

g. Upon completion of the test, store the carboys in a refrigerator at 4°C until use and clean-up.

---

1. Temperature and pH control will not be addressed by this experiment plan.

TABLE I.3-10

PILOT-COLUMN EXPERIMENTAL PROCEDURE

Measurements:

1. Once-a-Day

   a. Influent and effluent - TOC, DO, Cl_2 residual (free and total), pH, alkalinity and temperature

   b. Headloss through column(s)

   c. Flowrate

2. Twice Weekly - LLE and TOX

Sample Preparation:

1. The TOC and TOX samples are collected in 60 ml and 250 ml bottles, respectively. The bottles were prepped with $NaSO_3$ and H_2SO_4. $NaSO_3$ is used to control THM formation and/or quenches any free chlorine residual present. H_2SO_4 addition controls biological growth by pH reduction and, in the case of TOC, the lower pH precipitates inorganic TOC. The samples are stored in a refrigerator at 4°C until analyzed.

2. LLE samples are quenched with $NaSO_3$ to control THM formation in the event there is a free chlorine residual in the sample. $NaSO_3$ is added to each bottle prior to sample collection. 60 ml bottles are used for sample collection.

Experimental Plan:[1]

1. Preparation of Carbon

   a. Weigh out cleaned aluminum trays to the nearest 0.1 gm.

   b. A representative sample of the carbon in the manufacturers bag should be obtained and placed on the aluminum trays. Do not mound carbon. If possible, the contents of the bag ought to be processed through a properly cleaned sample splitter.

   c. Aluminum trays laden with carbon should be placed in an oven at 105°C overnight.

   d. Remove trays from the oven, allow to cool five minutes and weight immediately to the nearest 0.1 gm.

TABLE I.3-10 (Continued)

PILOT-COLUMN EXPERIMENTAL PROCEDURE

e. Pour carbon into cleaned glass beakers (BE CAREFUL not to lose any carbon) and gradually soak with Milli-Q or distilled water. Let stand overnight to ensure carbon is saturated.

2. Preparation of Sampling Equipment - all equipment which comes in contact with the GAC or the test water should be cleaned by the following technique.

   a. Using micro, a laboratory detergent which does not contain phosphates and/or leave a residue, wash all equipment thoroughly.

   b. Rinse with Milli-Q water several times. The Milli-Q system polishes a deionized water source in a three step process.
      i. An activated adsorption cartridge removes dissolved organics.
      ii. Two ion-exchange cartridges remove ionized inorganics.
      iii. A millipore membrane removes all micro-organisms greater than 0.22 µm.

   c. All glassware used when TOC adsorption is being evaluated should be rinsed twice more with Milli-Q and placed in a 105°F oven overnight. Glassware openings, and teflon pieces should be covered with foil before placement in the oven.

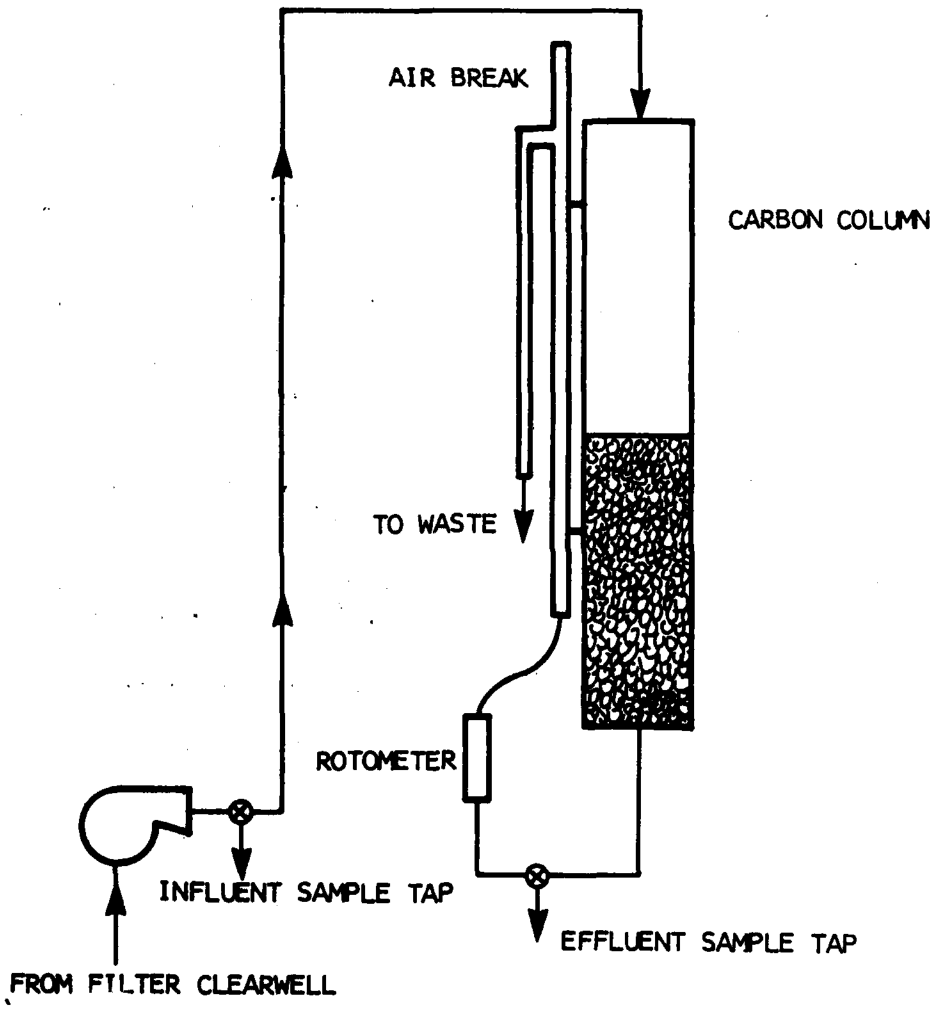
   d. All glassware used for volatile adsorption evaluation, should either be rinsed a second time and baked for one hour at 250°F or muffled at 400°F for one hour.

3. Setting Up Pilot-Columns - A written description of the pilot-column set-up is not provided; however, a schematic is included which indicates the set-up used at the EEWTP, see Figure I.3-33. Below are several points which should be implemented when setting up the experimental apparatus.

   a. Clean the columns, tubing, sample lines and screens with a mild laboratory detergent such as micro which does not contain phosphates or leave a residue.

   b. Due to the size of the pilot-columns, rinsing with potable water was necessary. The important consideration is to remove any residue inside the equipment.

   c. Once the equipment has drained, set up the experiment and load the columns with carbon. There are three sections to the pilot-columns used; therefore, one section was set-up initially.



GAC
PILOT-COLUMN SET-UP
FIGURE I. 3-33

TABLE I.3-10 (Continued)

PILOT-COLUMN EXPERIMENTAL PROCEDURE

4. Loading the Pilot-Columns

   a. The carbon should be saturated with water prior to packing the columns; see Step 1.

   b. Fill the first section of the column one-third full with potable water and begin adding carbon. Always keep the carbon submerged in water when loading. This provides for a uniformly packed column.

   c. Continue adding carbon and column sections until the desired depths and heights are achieved, respectively.

   d. Allow to stand overnight. Carbon is very porous and requires a long duration to ensure saturation is achieved.

   e. Slowly expand the bed 30% and continue backwashing until air bubbles and pockets of air are removed from carbon bed.

   f. Settle the expanded bed slowly but do not let water drain below the top of the column

5. Begin processing water and after a duration of time equivalent to the EBCT has passed, collect all the samples under "Measurements".

6. Continue processing water for the experimental time period taking samples as defined by "Measurements".

---

1. Temperature and pH control will not be addressed by this experiment plan.

SECTION 4

PACKED TOWER AERATION

BACKGROUND

One of the principle reasons for installation and operation of granular activated carbon at the EEWTP was for the removal of synthetic organic chemicals (SOCs) which might be present in the contaminated influent which would be relatively unprotected from potential industrial or commercial discharges of contaminants. Of the SOCs currently identified in wastewaters and water supplies, many are relatively volatile and removal may be achieved through aeration. Where feasible, aeration is usually cost-effective, particularly relative to granular activated carbon.

Of the available aeration processes, counter-current packed tower aeration is one of the most efficient in achieving mass transfer. Although other aeration processes may often be indicated, particularly where existing facilities make them attractive or where removal requirements may be less, packed tower aeration is usually the alternative of choice when designing new facilities specifically for high percent removals of VOCs.

With these considerations in mind, packed tower aeration was evaluated as a potential process alternative for an estuary water treatment plant. Inclusion of air stripping in an eventual design would provide an added barrier against volatile organic compounds (VOCs) and could potentially reduce GAC operational costs if VOC breakthrough were to be a criteria for regeneration. Alternatively, the inclusion of air stripping might allow the exclusion of the GAC process entirely. This latter is attractive if there is little concern for less volatile SOCs, or if other additional processes capable of removing non-volatile SOCs (such as reverse osmosis) are also considered.

In order to develop design criteria for packed tower aeration, the process was evaluated on a sidestream of actual plant water (gravity filter effluent), using a 380 m^3/day (35 gpm) pilot unit and simulating potential VOC contamination through the use of a spiking solution. Results from the pilot work were then utilized to optimize the design for a hypothetical influent situation which would be conservative with respect to potential spikes of the more volatile SOCs.

THEORY

Air stripping theory has been well developed in the chemical engineering literature over the last thirty to forty years. Kavanaugh and Trussell (1980,1981) have described how this theory might be applied to the removal of trace quantities of VOCs in water. This design model for packed tower aeration is briefly summarized here.

The depth of packing required for removal of VOCs in a counter-current tower is a complex function of the required removal, the compound's volatility, the air to liquid ratio, the liquid loading rate, and the physical and chemical conditions which affect rates of mass transfer. Assuming steady state operation, using chemical equilibria, and applying a mass balance around a differential height of packing, integrated over a total tower height, Z, the relevant expressions describing tower design can be developed. These are summaried below.

$$Z = (HTU)(NTU) \tag{1}$$

$$NTU = \frac{R}{R-1} \ln \left(\frac{C_{in}/C_{out}\,(R-1) + 1}{R} \right) \tag{2}$$

$$R = \frac{H}{P_t}\frac{G}{L} \tag{3}$$

$$HTU = \frac{L}{(K_L a) C_o} \tag{4}$$

where:

- Z is packing height (m)
- NTU is number of transfer units (dimensionless)
- R is the stripping factor (dimensionless)
- H is the Henry's constant for the compound to be removed (atm)
- P_t is the ambient pressure (atm)
- HTU is the height of a transfer unit (m)
- L is the liquid loading rate (kmole/sec/m^2)
- G is the air loading rate (kmole/sec/m^2)
- $K_L a$ is the product of the overall liquid mass transfer coefficient, K_L (m/sec), and the specific interfacial area, a (m^2/m^3), in the packing system
- C_o is the molar density of water (55.6 kmole/m^3 at 20°C)
- C_{in} is the influent concentration of the compound to be removed (units of concentration)
- C_{out} is the effluent concentration of the compound to be removed (units of concentration)

As shown in equation 2, the number of transfer units is related to the volatility of the compound to be removed as characterized by the Henry's constant, the air to liquid ratio, and the influent and effluent concentrations. Henry's constant is an equilibrium parameter which indicates the relative volatility of a compound. The height of a transfer unit (equation 4), on the other hand, is dependent on the conditions for mass transfer from water to air and is inversely proportional to the overall liquid phase mass transfer coefficient.

Equation 3 above is used to calculate the stripping factor, R. The stripping factor is a parameter used in packed tower aeration design and is proportional to the product of the Henry's constant and the air to liquid ratio.

Equation 4 is based on the two film theory of mass transfer with an assumption that mass transfer is controlled by the liquid-phase resistance. This is generally recognized as a valid approximation for compounds with high values of H (Roberts, 1981, 1982; MacKay and Wolkoff, 1973), and is discussed further in a later section of this paper.

Use of the expression for HTU requires data for K_L and a for the system under consideration. A typical empirical correlation used for liquid-phase mass transfer coefficients in towers containing randomly packed materials is the Sherwood-Hollaway correlation (Sherwood and Holloway, 1941):

$$\frac{K_L a}{D_A} = \alpha \left[\frac{L'}{\mu_L}\right]^{1-n} \left[\frac{\mu_L}{\rho_L D_A}\right]^{0.5} \qquad (5)$$

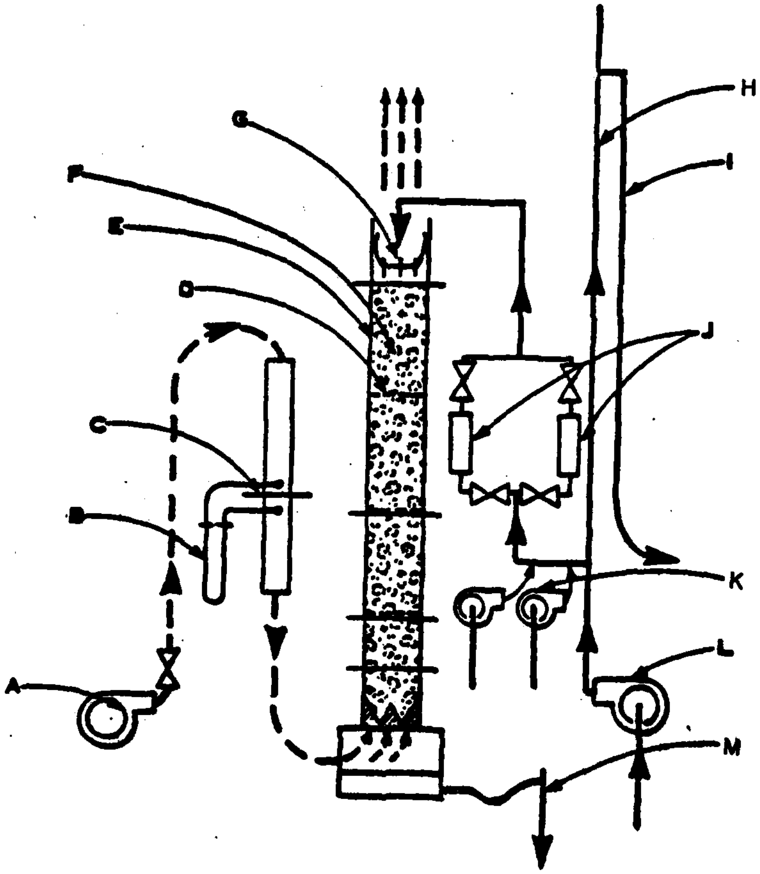
where D_A is the molecular diffusion coefficient of the compound to be removed (solute A) in water (sq ft/hr), μ_L and ρ_L are the liquid viscosity and density (lb/ft-hr and lb/cf, respectively), L' is the liquid mass flux rate (lb/sq ft-hr), and $K_L a$ has units of hr^{-1}. α and n are empirical constants that depend on the type and size of packing.

Correlations other than the Sherwood-Hollaway relationship shown here may be found in the mass transfer literature; see Treybal (1980). Preferrably, values of $K_L a$ should be determined from pilot studies wherever possible. In those cases, the correlations are useful primarily for extrapolating beyond the specifically tested experimental conditions.

EEWTP PILOT WORK

Because mass transfer coefficients depend so strongly on packing type, temperature, and liquid and gas flow rates, pilot results are extremely important for the development of accurate design criteria for a given situation. With proper analysis, these results may be utilized to evaluate a range of different designs for a variety of potential influent scenarios.

During this project, a mobile pilot packed tower was operated at flows of 20 to 380 m^3/d (2 to 35 gpm). The air stripper was operated for a six month period beginning in August 1982, using the estuary/treated wastewater mixture and with pretreatment consisting of alum/polymer coagulation, flocculation, and sedimentation, followed by chlorination and dual media filtration. A sidestream of this water was then spiked with five VOCs to a final concentration of between 80 and 200 ug/L and fed directly to the top of the air stripping pilot unit (see Figures I.4-1 and I.4-2). The five VOCs studied were all halogenated organics: carbon tetrachloride (CCl_4), tetrachloroethene (PCE), trichloroethene (TCE), chloroform ($CHCl_3$), and bromoform ($CHBr_3$). These compounds were selected as common contaminants which represent a wide range of volatility (Henry's constants from 60 to 1200 atm).



A - Fan, 0-300 cfm
B - Inclined Manometer
C - 10 inch Flange Orifice air Flow Meter
D - Redistributor
E - 12 inch Diameter, Plexiglass Tower Shell
F - Packing
G - Water Distributor
H - 14 ft. Standpipe
I - Standpipe Overflow to Waste
J - 0-6 and 5 to 40 gpm Rotameters
K - Chemical Feed Pumps, Tygon tubing
L - Influent Water Pump 40 gpm
M - Adjustable Height Tower Effluent Overflow

PILOT AERATION TOWER SCHEMATIC
FIGURE I. 4-1

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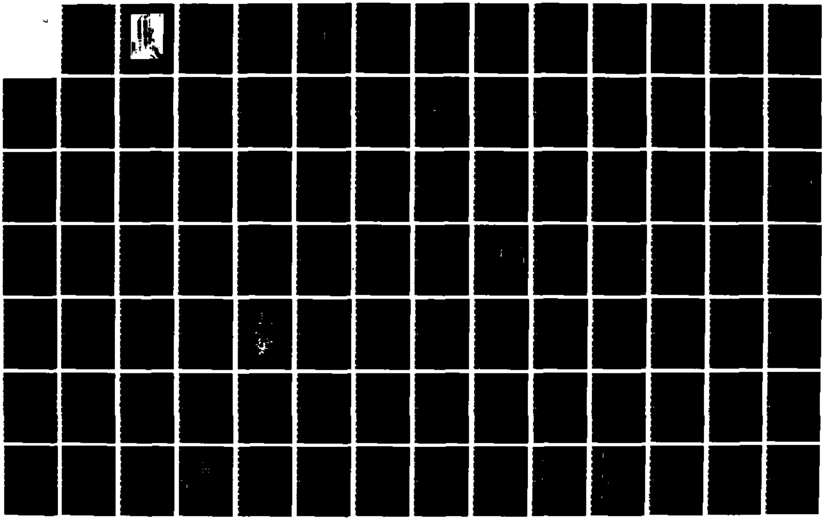

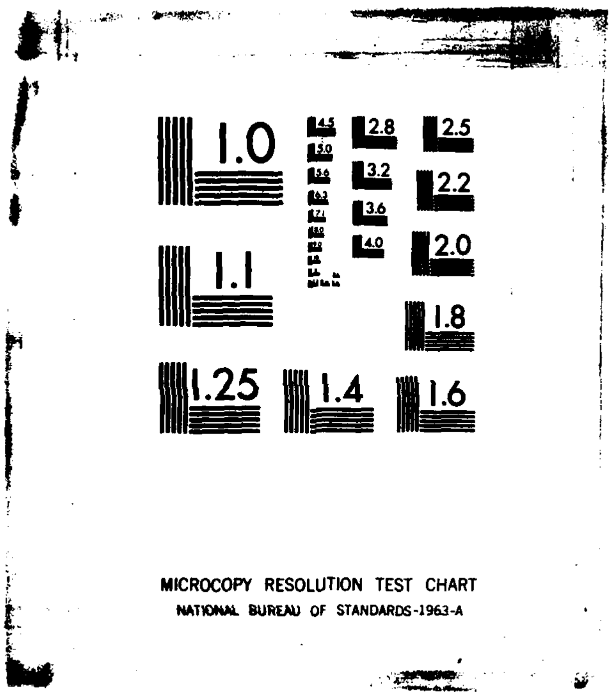
1.0
1.1
1.25
1.4
1.6
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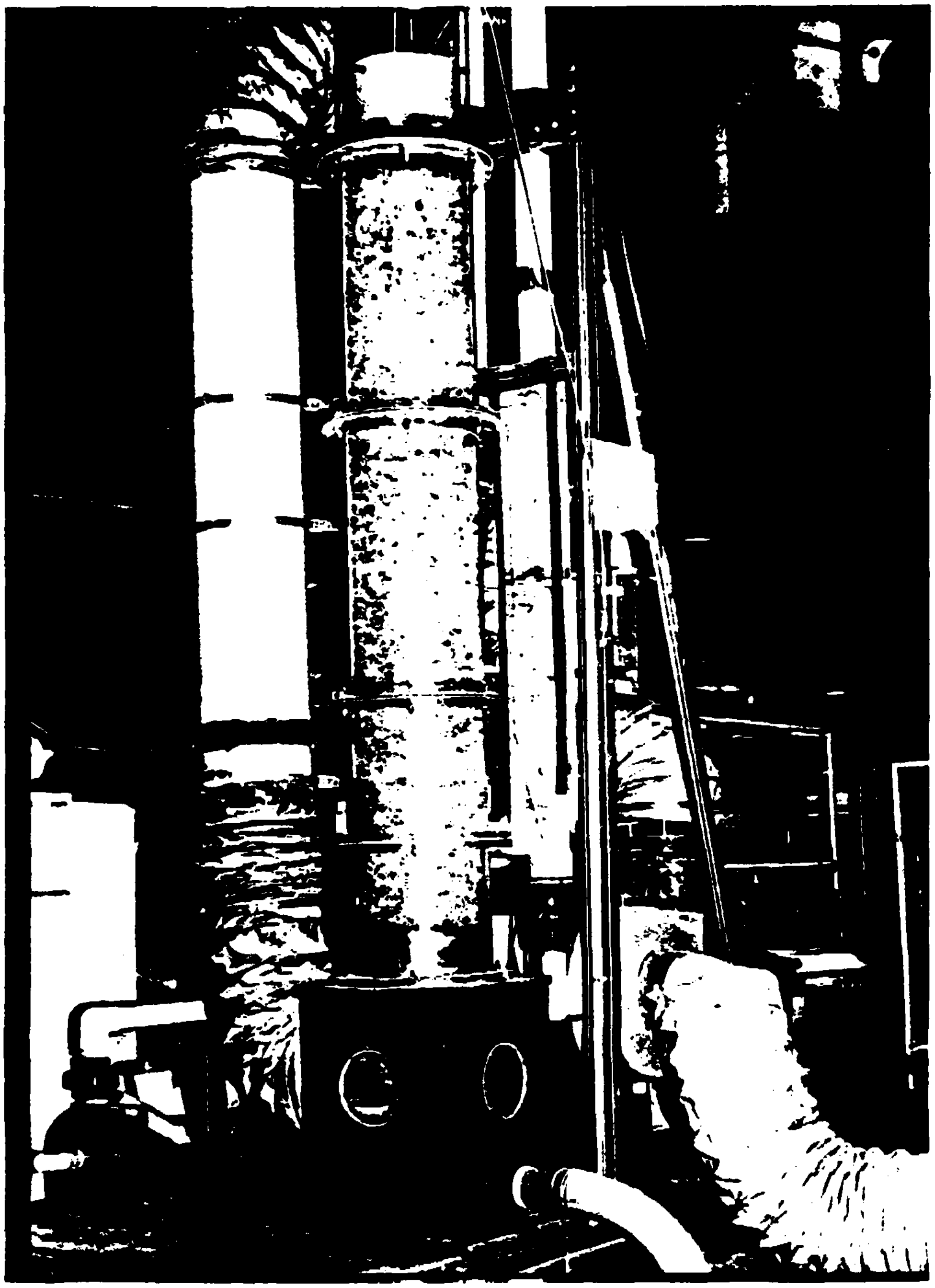
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



MOBILE PILOT AIR STRIPPER INSTALLED AT EEWTP

FIGURE I. 4-2

METHODS

The VOC spiking solution was prepared by first diluting approximately 10 g of each compound into one liter of methanol and then diluting this solution 10:1 with isopropyl alcohol. The resulting 1 g/L alcohol spiking solution was then fed directly into the pilot unit influent stream continuously for the duration of the run using a peristaltic metering pump. Prior to any sampling, the pilot unit was run for approximately one hour, after which steady state conditions were reached. Triplicate pairs of stripping tower influent and effluent samples were collected at ten minute intervals for each tower run. Samples were taken in 60 ml amber bottles capped with teflon-lined septa and containing 0.5 ml of 2N sodium sulfite to quench any free chlorine which might otherwise lead to the formation of halogenated VOCs in the sample bottle. The five halogenated organics were analyzed quantitatively by the techniques described in Chapter 4 of this report.

EXPERIMENTAL DESIGN

Equipment

Properly designed pilot equipment includes the ability for accurate air and water flow measurement, the selection of an appropriate size and type of packing, and facilities for proper air and water distribution. This latter includes sizing to avoid potential scale-up effects associated with liquid flow channelization along the column walls. It is generally recommended that the ratio of column diameter to packing size be at least 8:1 and preferably up to 15:1 (Treyball, 1980). Flow redistribution should be provided at regular intervals, with maximum acceptable distances varying from two to ten times the tower diameter (Treybal, 1980).

The mobile pilot equipment utilized on this project was designed for a 12:1 column to packing ratio. The column had redistributor rings installed at every 2 ft of packed depth. A schematic of the unit is shown in Figure I.4-1. Figure I.4-2 is a photograph of the installed equipment. The column is constructed of two foot sections of 11.5-inch diameter plexiglass. One-inch Intalox polypropylene saddles were used as packing material.

Experimental Conditions

It is important to examine a range of liquid loading conditions which will cover the range of practical possibilities for design. Stripping factors should be sufficiently high to minimize the effects of uncertainties in values for H, as taken from the literature. It can be seen from equation 2 that at very high R values, NTU is relatively insensitive to R, and thus insensitive to H. This allows for more accurate determinations of NTU and, hence, more accurate determination of HTU (equation 1) and $K_L a$ (equation 4).

For the pilot results reported in this paper, the range of experimental conditions was well below flooding limits for the tower and covered a broad spectrum of conditions, including five liquid rates at constant air flow, plus four

additional liquid rates at a varying gas flow but constant R. The range of conditions studied is shown in Table I.4-1.

TABLE I.4-1

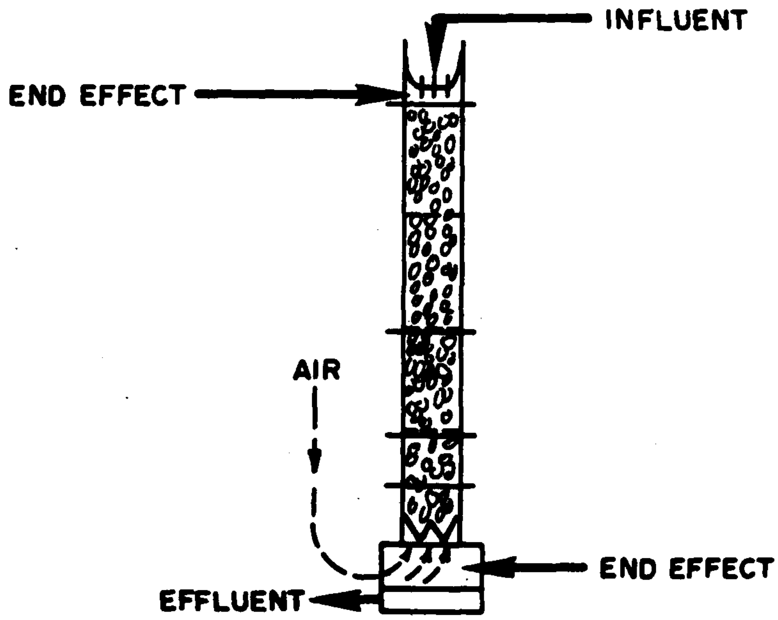
EXPERIMENTAL CONDITIONS FOR PILOT TOWER RUNS[1]

L l/m^2-sec (gpm/sf)	G l/m^2-sec (cfm/sf)	Stripping Factor, R (at 20°C[2])				
		CCl_4	PCE	TCE	$CHCl_3$	$CHBr_3$
1.2 (1.8)	655 (129)	520	430	220	70	20
3.4 (5.0)	513 (101)	140	120	61	19	5.7
3.7 (5.5)	655 (129)	170	140	72	23	6.6
4.3 (6.4)	655 (129)	140	120	62	19	5.7
5.8 (8.5)	868 (171)	140	120	61	19	5.6
8.1 (11.9)	1219 (240)	140	120	61	19	5.6
8.5 (12.5)	655 (129)	74	60	31	9.8	2.9
14.9 (21.9)	655 (129)	42	34	18	5.6	1.6

1 Each condition evaluated at four different packings
2 Using assumed Henry's constants as shown in Table I.4-2

Evaluation of End Effects

In evaluating the results from pilot operation, it is important to isolate the removal which occurs in the packing from that which occurs at the ends of the tower. These so-called "end effects" are shown schematically in Figure I.4-3. End effects can be thought of as additional "transfer units" attributable to mass transfer occurring both above and below the packing. They can be described by the following equation:



SCHEMATIC OF END EFFECTS
IN PACKED TOWER AERATION
FIGURE I. 4-3

$$NTU_{measured} = (1/HTU)Z + NTU_{end\ effects} \tag{6}$$

The term (1/HTU)Z is the theoretical NTU of the packing material alone. Thus, one means of evaluating end effects is as the intercept of a plot of $NTU_{measured}$ versus packing depth. This requires that the pilot tower be evaluated under the same run conditions at several different depths. For the pilot results reported here, each run condition was evaluated at four different depths of packing: 0.75 ft, 1.72 ft, 3.7 ft, 5.69 ft.

Influent water temperatures were not controlled and varied between 9°C and 15°C over the course of the experiment. However, all computations were based on temperature corrected Henry's constants (Table I.4-2), and calculated NTUs were further adjusted to account for temperature related variations in liquid viscosity, liquid density, and compound molecular diffusivity. The temperature correction used for molecular diffusivity was the Wilke Chang relation (Wike and Chang, 1955).

TABLE I.4-2

HENRY'S CONSTANTS AS A FUNCTION OF TEMPERATURE

Compound	H at 20°C (atm)	Assumed Temperature Correlation[1] (T = temperature, °K)
Carbon Tetrachloride CCl_4[2]	1280	$Log(H) = \frac{-2038}{T} + 10.06$
Tetrachloroethylene PCE[2]	1040	$Log(H) = \frac{-2159}{T} + 10.38$
Trichloroethylene TCE[2]	540	$Log(H) = \frac{-1716}{T} + 8.59$
Chloroform $CHCl_3$[2]	170	$Log(H) = \frac{-2013}{T} + 9.10$
Bromoform $CHBr_3$[3]	50	$Log(H) = \frac{-3607}{T} + 14.0$

1 $Log(H) = \frac{-\Delta H^o}{RT} + k$ where R = universal gas constant, 1.987 $\frac{kcal}{kmole\text{-}^oK}$; T = absolute temperature, °K; ΔH^o = change in enthalpy due to dissolution of compound in water (kcal/kmole); and k = constant.

2 Correlations as reported by Kavanaugh and Trussell (1980, 1981).

3 Correlation adopted from graphical results presented by Selleck, et al (1981).

EXPERIMENTAL RESULTS

The range of conditions evaluated with the mobile pilot unit at the EEWTP are as outlined in Table I.4-1. After normalization of the computed NTU to 20°C by the above techniques, plots of measured NTU versus packing depth were used to isolate end effects and to determine HTU (and thus K_La) for each set of run conditions. One such plot is shown in Figure I.4-4 and is typical of the generally good linear fits which were obtained. The results from the NTU versus depth plots for the different run conditions are shown in Table I.4-3. Confidence levels of ninety percent are shown for the determined K_La values for each compound at each condition[1]. The results generally follow the expected pattern of increasing mass transfer coefficient with liquid loading rate and, for the most part, show good correlations. The exception is with some of the results at higher liquid loading rates and most notably for bromoform which was the least volatile compound studied. Results for bromoform at the two highest liquid rates cannot be considered statistically significant and are not utilized in further analysis. Possible explanations for the anomolous appearance of these results are offered in the "Discussion" section which follows.

Correlation of Mass Transfer Coefficients

It is useful to examine the pilot study results in the context of the Sherwood-Hollaway correlation previously presented. By taking the logarithm of both sides, equation 5, can be rewritten as follows:

$$\text{Log}\left[\frac{K_L a}{D_A}\right] - 0.5\ \text{Log}\left[\frac{\mu_L}{\rho_L D_A}\right] = (1-n)\ \text{Log}\ (L/\mu_L) + \text{Log}\ \alpha \qquad (7)$$

Thus, a plot of the left hand term against Log (L/μ_L) will have (1-n) and Log as the slope and intercept, respectively, of a linear plot. Because the correlation uses molecular diffusivity to normalize between compounds, it is useful to examine the results for all five VOCs studied on the same plot. Figure I.4-5 presents the EEWTP mass transfer results in this manner.

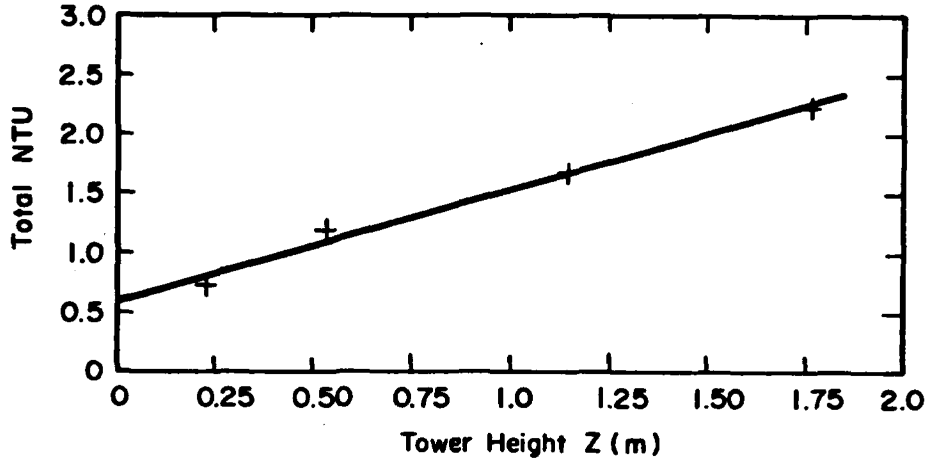
---

1. Ninety percent confidence intervals are based on confidence intervals around the slope of the regression line for the plot of NTU versus depth. Because four points were available for the regression, the confidence intervals utilize t-statistics with two degrees of freedom per the following formula:

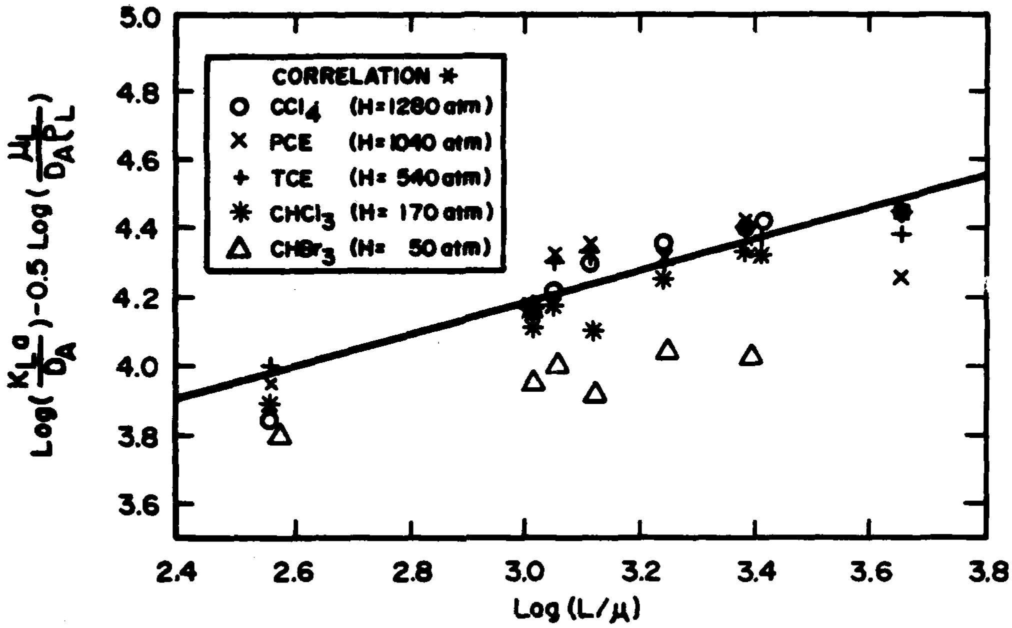
   Ninety percent confidence region for slope $= \pm(t)(s)\left[\sum_{i=1}^{n}(x_i - \bar{x})^2\right]^{-0.5}$ where $\bar{x}$ = mean of x;

   $$s = \left[\frac{1}{n-2}\sum_{i=1}^{4}(Y_i - \text{intercept} - \text{slope}\ (X_i))^2\right]^{0.5}$$; t = 2.92 = the 95% percentile

   of the t-statistic with 2 degrees of freedom; x_i and y_i are individual points for depth and NTU, respectively.



PILOT OF NTU vs DEPTH FOR CHLOROFORM AT ONE RUN CONDITITION
(L = 5.8 l/m^2-sec, G = 868 l/m^2-sec)
FIGURE I. 4-4



*(All Compounds Except $CHBr_3$)

PILOT DATA FOR ALL COMPOUNDS FITTED TO SHERWOOD-HOLLAWAY CORRELATION (alpha = 696,n = 0.55)

FIGURE I. 4-5

TABLE I.4-3
PILOT DETERMINATIONS OF K_La

Run Conditions		Mass Transfer Results - Plot of NTU versus Depth									
		CCL_4		PCE		TCE		$CHCL_3$		$CHBr_3$	
L l/m^2-sec (gpm/sf)	G l/m^2-sec (cfm/sf)	Mult-R Regression Coeff.	K_La $\pm$90% Conf. Region hr^{-1}	Mult-R Regression Coeff.	K_La $\pm$90% Conf. Region hr^{-1}	Mult-R Regression Coeff.	K_La $\pm$90% Conf. Region hr^{-1}	Mult-R Regression Coeff	K_La $\pm$90% Conf. Region hr^{-1}	Mult-R Regression Coeff.	K_La 90% Conf. Region hr^{-1}
1.2 (1.8)	655 (129)	0.944	8.26 $\pm$1.33	0.999	10.5 $\pm$0.8	0.99997	11.4 $\pm$0.1	0.992	9.04 $\pm$1.67	0.981	7.70 $\pm$2.22
3.4 (5.0)	513 (101)	0.913	16.5 $\pm$10.5	0.930	16.2 $\pm$9.2	0.946	16.9 $\pm$8.3	0.958	15.7 $\pm$6.7	0.780	11.0 $\pm$12.1
3.7 (5.5)	655 (129)	0.974	18.9 $\pm$3.2	0.986	20.8 $\pm$2.5	0.987	20.8 $\pm$2.4	0.969	18.9 $\pm$3.4	0.875	12.1 $\pm$4.6
4.3 (6.4)	655 (129)	0.995	22.4 $\pm$3.2	0.982	24.5 $\pm$6.8	0.991	24.2 $\pm$4.8	0.995	15.4 $\pm$2.3	0.859	9.93 $\pm$8.31
5.8 (8.5)	868 (171)	0.997	25.4 $\pm$2.9	0.994	23.0 $\pm$3.7	0.991	23.2 $\pm$4.5	0.988	21.5 $\pm$4.8	0.986	13.5 $\pm$3.3
8.1 (11.9)	1219 (240)	0.911	28.8 $\pm$18.6	0.933	28.7 $\pm$15.8	0.927	28.8 $\pm$16.7	0.866	26.5 $\pm$21.5	0.555	12.7 $\pm$23.5
8.5 (12.5)	655 (129)	0.739	29.3 $\pm$36.0	0.716	27.0 $\pm$35.1	0.740	27.6 $\pm$33.8	0.649	26.0 $\pm$39.5	0.032	3.84 $\pm$43.7
14.9 (21.9)	655 (129)	0.961	30.9 $\pm$12.8	0.934	29.5 $\pm$16.2	0.939	27.5 $\pm$14.4	0.888	21.3 $\pm$15.6	0.601	-18.5 $\pm$31.1

Discussion

As indicated in Figure I.4-5, results from the EEWTP pilot work show a generally good fit to the Sherwood-Hollaway correlation. For four of the five compounds studied the correlation represents a valid means of interpolating between piloted data points and, as such, presents a valuable design tool. Other important observations concerning the correlation are noted below:

1. Coefficients of the Sherwood-Hollaway correlation for four of the five compounds (CCl_4, PCE, TCE, and $CHCl_3$) with 1" Intalox saddles are as indicated in Figure I.4-5: $\alpha = 698$ and $n = 0.55$. It should be noted that the feasible range of practical operation is generally at high liquid rates, in the range of those tested (Figure I.4-5). Because the data is somewhat distant from the y-axis, results are quite sensitive to changes in one parameter without corresponding changes in the other. That is to say, α and n should be considered as paired parameters and designers should be quite leary of selecting either of the two values independently from the literature.

2. Bromoform results do not appear to fit the correlation as well as the other four compounds. Because the experimental design was centered primarily around the more volatile compounds, the stripping factors at which the bromoform results were obtained are quite low, as indicated in Table I.4-1. At these very low stripping factors (below 3), the pilot results are quite sensitive to the assumed value for Henry's constant. Henry's constants are still relatively uncertain for VOCs at dilute concentrations and have been the subject of considerable research. Partition coefficients may vary with the nature of the solvent water; recent studies suggest that Henry's constant for a VOC in wastewater may be higher than for the same compound in pure water (Munz and Roberts, 1982). Because the bromoform data are more senstive to Henry's constant than the data for other compounds, there is considerably less certainty in the results; see Table I.4-3.

With this uncertainty recognized, it is nonetheless useful to explore alternative explanations for the poor fit of the Sherwood-Hollaway correlation to the bromoform results. One likely explanation is that, for bromoform, resistance to mass transfer in the gas phase has more relative importance and can no longer be ignored. The computation of K_La is based upon an assumption that mass transfer is controlled predominantly by liquid-phase resistance with gas-phase resistance of neglible importance. However, both liquid- and gas-phase resistance may be important for less volatile compounds. That is:

$$R_T = R_L + R_G \tag{8}$$

$$\frac{1}{K_L} = \frac{1}{k_L} + \frac{C_o}{H}\left(\frac{1}{k_G}\right) \tag{9}$$

where R_T, R_L, and R_G = total, liquid-phase, and gas-phase mass transfer resistances, respectively, K_L = overall mass transfer coefficient (m/s); k_L = local liquid-phase transfer coefficient (m/s); k_G = local gas-phase transfer

coefficient (kmole·sec^{-1}·atm^{-1}·m^{-2}); C_o = molar density of water (kmole/m^3); and H = Henry's constant (atm).

As demonstrated by Roberts et al (1982), the relative importance of the liquid- and gas-phase resistances can be evaluated by rewriting equations 8 and 9 to the form shown below:

$$\frac{R_L}{R_G} = \frac{H}{C_o}\left(\frac{k_G}{k_L}\right) \tag{10}$$

For liquid phase resistance to dominate (R_L/R_G greater than or equal to 20), the Henry's constant and the value of k_G/k_L must be sufficiently large. Because bromoform has the smallest Henry's constant of the compounds studied, it is by far the most susceptible to any lowering of k_G/k_L which will occur at the higher liquid rates. The degree to which gas-phase resistance affects bromoform mass transfer cannot be discerned from the available data, largely because of uncertainties in Henry's constants as previously discussed. The relative importance of the liquid- and gas-phase resistances for compounds of varying volatility is an area which deserves further research.

For the purposes of the current study, the pilot data at the selected run conditions were insufficient to allow accurate extrapolation of pilot results for bromoform to conditions other than those which were specifically studied.

DESIGN

The theoretical concepts can be used to develop design criteria for a packed tower, evaluate alternative designs with respect to key parameter selections, and evaluate the overall ecomonic feasibility of packed tower aeration.

For a selected packing material, the suggested design procedure is as shown in Table I.4-4. As is often the case with design, there is more than one solution which will meet the requirements of the process. Specifically, a given removal of a selected compound can be accomplished at any number of air to liquid ratios and at a variety of liquid loading rates (tower diameters), with total tower height varying for each case as required. The optimum design will be that with least total cost (capital plus operating costs), and is best determined by evaluating a range of values for key parameters. The key parameters to be selected are the air to liquid ratio (which corresponds to the stripping factor, R), and the air pressure drop (Δh), as indicated in Table I.4-4. With experience and judgment, appropriate ranges for both R and Δh can be developed for selected packings and are largely independent of the compound under evaluation. Optimum design is then determined by following the suggested design procedure for the range of selected choices and the specific conditions at hand, and comparing costs.

When several trace volatile contaminants are present, the design procedure should be carried out for each. Final design criteria will be based on the compound whose effluent standard is most difficult to achieve (Kavanaugh and Trussell, 1981).

TABLE I.4-4

SUGGESTED DESIGN PROCESS

Step	Required Information; Obtain from Literature, Bench Studies, or Pilot Operations	Results Obtained
1. Select air to liquid ratio, G/L (select stripping factor, R)	Henry's constant, H, at the design temperature	$R = (\frac{H}{P_t})(\frac{G}{L})$ (eqn 3) $\frac{G}{L} = \frac{P_t R}{H}$
2. Select air pressure drop, h	Pressure drop as a function of G and L; e.g., pressure drop curve, where $h = f(G, \frac{G}{L})$	G from pressure drop curve (Figure I.4-6) $L = \frac{G}{(G/L)}$
3. Determine height of transfer unit	Mass transfer coefficient, $K_L a$, at the liquid rate L and gas rate G	$HTU = \frac{L}{(K_L a) C_o}$ (eqn 4)
4. Determine number of transfer units at given flow, Q and for required influent and effluent concentration Xi and Xo		$NTU = F(R, \frac{Xi}{Xo})$ (eqn 2) $Z = HTU \cdot NTU$ (eqn 1) Tower Area $= \frac{Q}{L''}$ (L'' = volumetric liquid loading rate)

The final step in the design procedure is to compute the capital costs for the required packing height and volume as well as the operating costs associated with liquid pumping to tower height Z and air flow through the required depth of packing at a headloss of Δh. Optimum design is determined by following the suggested design procedure for the range of stripping factors and pressure drops selected and comparing results.

DESIGN OPTIMIZATION

Results from the pilot work conducted at the EEWTP have been applied to a hypothetical full scale application in order to determine the optimum design for a selected scenario. The given requirements for this hypothetical situation are as follows:

Flow: 3,785 m^3/day (100 MGD)
Contaminant: Chloroform ($CHCl_3$)
Influent Concentration: 1,500 ug/L
Effluent Concentration: 50 ug/L

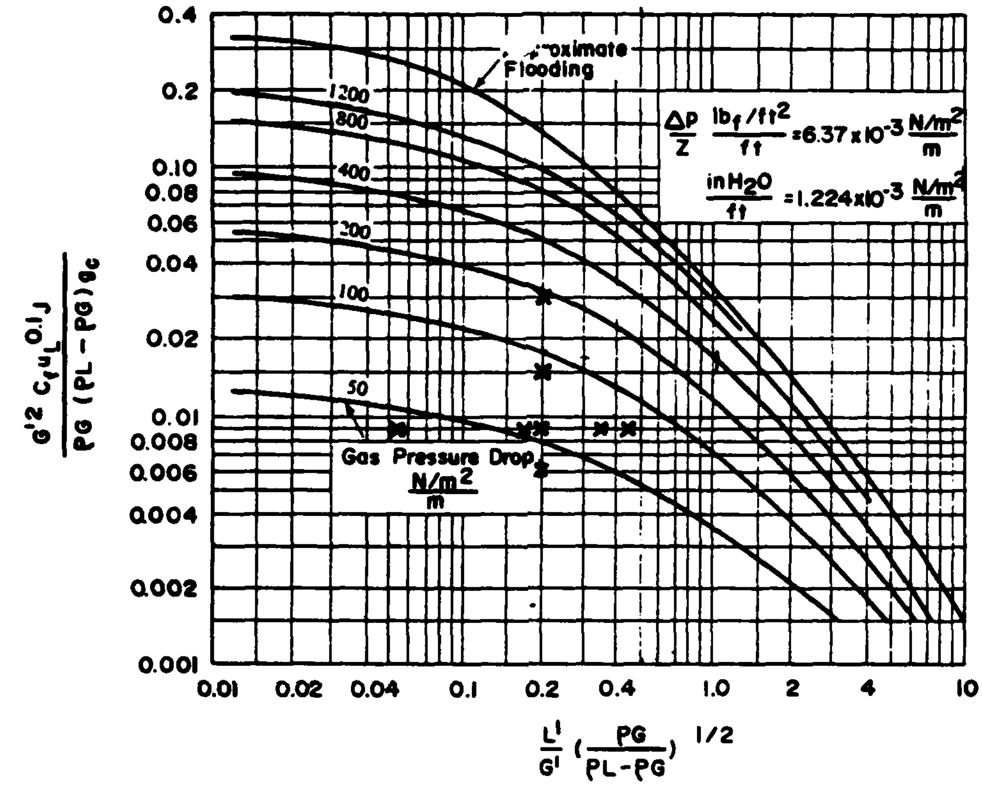
A design temperature of 20°C was assumed. Performance at other temperatures has been evaluated, assuming proper adjustment to the Henry's constant (Table I.4-2), as well as to liquid viscosity, liquid density, and molecular diffusivity. The results indicate that removals will drop to ninety percent at a minimum modeled temperature of 6°C.

Rapid evaluation of alternative designs was achieved through the use of computerized versions of both the Sherwood-Hollaway correlation and the design model previously presented. Coefficients for the correlation were those generated from the pilot work (α = 698 and n = 0.55). Thirty different feasible designs were evaluated, representing stripping factors between two and forty, and pressure drops between 50 N/m^2-m (0.062 inches of water/foot) and 400 N/m^2-m (0.49 inches of water/foot). The generalized findings are discussed below.

Tower Volume

The total volume of packing material in a tower aeration system is a product of the height of the tower(s) and the total cross sectional area. Because this parameter bears directly upon the system's capital cost, it is informative to observe how it is affected by the selection of criteria for design. In Figure I.4-7, lines of constant tower packing volume (volume isopleths) are shown against axis of two independent variables: stripping factor (R), and air pressure loss (Δh, pressure drop per foot of packing).

From Figure I.4-7, it can be observed that, for any selected value of R, an increase in allowable air pressure drop will result in a decreased total packing volume. Increases in allowable pressure drop at a constant air to liquid ratio permit higher gas and liquid loading rates,or reduced tower area. With respect to tower height, the number of transfer units (NTU) does not vary since the stripping factor is constant. HTU increases only slightly (equation 4), since mass transfer is improved at the higher liquid rates (Figure I.4-5). Overall, the

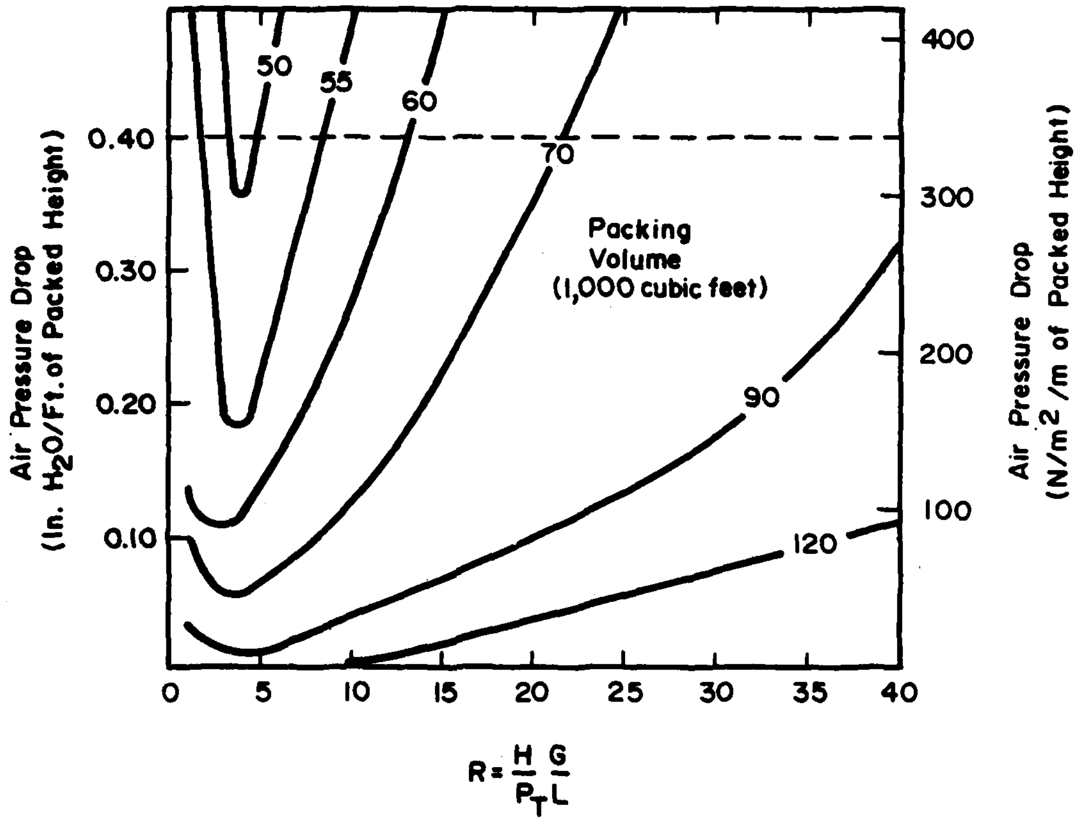


Flooding and pressure drop in random-packed towers. For SI units, $g_c = 1$ and $J = 1$. For $G' = lb/ft^2 \cdot h$, $\rho = lb/ft^3$, $\mu_L = cP$, $g_c = 4.18 \times 10^8$, $J = 1.502$. (Coordinates of Eckert[5], Chemical Process Products Division, Norton Co.); C_f for 1" plastic Super Intalox saddles = 33.

X = Run condition piloted at the EEWTP.

FLOODING AND PRESSURE DROP (FROM TREYBAL[11])

FIGURE I. 4-6



PACKING VOLUME (1000 CUBIC FEET)
CHLOROFORM, $X_i/X_o = 30$ ($T = 20^\circ C$)
FIGURE I. 4-7

total packing volume requirement is reduced with higher unit pressure drop. Tower volume can thus be decreased by operating at higher loading rates and pressure drops, within the constraints of not flooding the tower. The trade-off, however, is in the blower power costs of the additional pressure requirements, as discussed in the following section.

Variation of stripping factors for a constant selection of air pressure drop is illustrated by the dashed line in Figure I.4-7. In this case, increasing R is associated with increasing removal efficiency and a reduction in tower height. Essentially, NTU decreases with increasing R in accordance with equation 2. At the same time, however, increasing the air to liquid ratio at constant pressure drop requires that the liquid loading rate be reduced. This is accomplished by pumping the required flow through larger cross-sectional area. As illustrated in Figure I.4-7, increases in R above three or four result in a net increase in tower volume indicating that reductions in tower height are more than offset by increases in area. At lower R values, NTU is very sensitive to R, and decreases in tower height are sufficiently large to outweigh the associated increases in area. Thus, the optimum value of R, with respect to tower volume, lies between three and four for the case studied.

Operating Horsepower

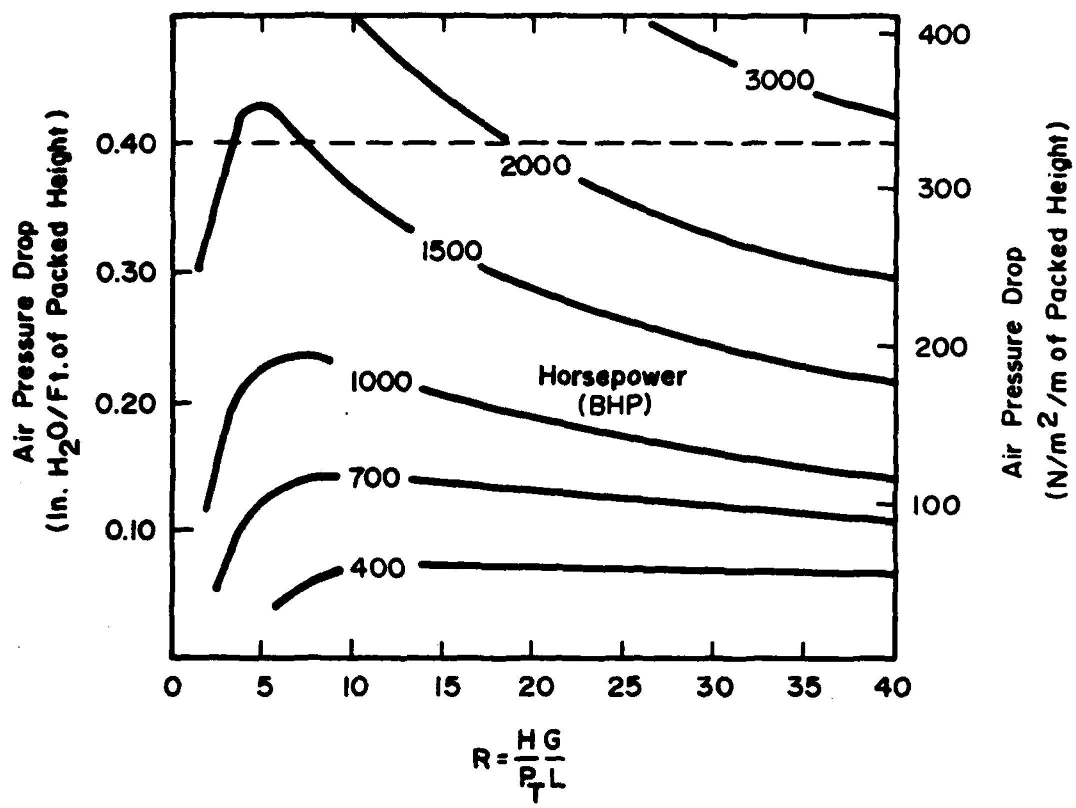
Just as packing volume is related to capital cost, brake horsepowers for air blowers and water pumps will largely control the operational costs of packed tower aeration systems. Figure I.4-8 shows isopleths for total horsepower requirement as a function of the same two independent variables used in Figure I.4-7. Blower horsepower was assumed using the standard equation for adiabatic compression:[44]

$$BHP = \frac{wRT}{550ne}\left((P_{out}/P_{in})^{2} - 1\right)$$

where w = air flow, lb/sec; R = gas constant, 53.5; T = absolute inlet temperature, ^{o}R; P_{in} = absolute inlet pressure, psia; P_{out} = absolute outlet pressure, psia; n = a constant of 0.283 for air; e = compressor efficiency). Blower efficiency was assumed at seventy percent. Pumping horsepower was based upon pumping the entire flow to the height of the tower packing and at an efficiency of eighty percent.

As expected, total horsepower increases with increases in tower pressure drop criteria. At a given air to liquid ratio, gas flow rate is fixed; increased pressure requirements at higher headlosses will lead directly to increases in horsepower. Modest increases in tower height at the higher pressure drops (higher surface loading rates) further increase the required blower outlet pressure and also raise the horsepower requirements for liquid pumping. The overall increase in horsepower with pressure drop is thus substantial, as indicated in Figure I.4-8.

For a constant air pressure drop, variations in stripping factor affect total horsepower in much the same way as they affect packing volume. For R less than four, increasing R leads to a drop in total horsepower due to dramatic



TOTAL HORSEPOWER (BHP)
CHLOROFORM, X_i/X_o = 30 (T = 20° C)
FIGURE I. 4-8

reductions in tower height. As R increases, however, the total gas flow is increasing relative to the fixed liquid flow requirement. This increased gas flow causes increased power requirements which, above a certain value of R, more than offset the power reductions associated with reduced tower height. With a constant pressure drop of 325 N/m^2-m (0.40 inches H_2O/ft) the minimum operating horsepower is shown to occur at an R value of about five. This is illustrated by the dashed line in Figure I.4-8. In general, the optimum stripping factor, with respect to total operating horsepower, lies somewhere between five and ten for the situation studied.

Total Cost

Figures I.4-7 and I.4-8 indicate that the optimum design conditions with respect to tower volume (or capital cost) and brake horsepower (or operational costs) are not the same. In order to determine the "true" optimum design, it is therefore necessary to evaluate the effect of the design criteria on overall cost. Ideally, complete cost estimates would be conducted at each feasible design. It is more practical, however, to conduct first a less refined evaluation of relative costs, and then to conduct more detailed estimates of those alternatives which appear most promising. As a preliminary means of evaluating relative costs for the hypothetical situation under study, the following assumptions were made:

1. Capital costs were amortized over a 20-year life and with an assumed interest rate of eight percent.

2. Many capital costs associated with a complete process, such as liquid clearwells, liquid piping, and electrical work, were assumed to be relatively constant between alternative designs for the given flow rate.

3. Of those capital costs which vary considerably between designs, such as for packing material, tower structure, tower internals, blowers, and pumping equipment, cost estimates were made. Manufacturer's cost information was obtained and cost curves were developed for equipment items, based on appropriate criteria. For example, costs for packing and tower internals were related to tower volume; tower structural cost was related to shell surface area; and pump costs were related to flow and tower height. For the purposes of the optimization discussed here, an assumption of $25/cubic foot of packing was made.

   This cost is intended only to represent relative costs for those items which vary between designs and is not intended to represent total capital costs for the packed aeration process.

4. As with capital costs, many operational and maintenance costs, such as labor requirements and general maintenance, were assumed to be constant between alternative designs.

5. The only operational costs assumed to vary between designs were pumping costs and blower costs, both of which are measured in terms of horsepower requirements. For the study discussed here, power costs were estimated at \$0.07/kw-hr.

Using the assumptions cited above, it was possible to normalize the findings shown in Figures I.4-7 and I.4-8 to the common denominator of annualized cost for the associated volume and power requirements. Lines of constant relative cost, in cents per thousand gallons, are shown in Figure I.4-9 against the same two independent variables: stripping factor and air pressure drop. This cost is intended only to represent relative costs of the stripping process, and that site work, excavation, tower foundation, yard piping, clearwells, engineering, and administration costs are not included.

As indicated in Figure I.4-9, the optimum design for the example situation lies at a stripping factor of five and a design headloss of less than 0.06 in-H_2O/ft. For 96.6 percent chloroform removal using 1-inch Super-intalox saddles, the optimum air to liquid ratio is approximately 39:1 (volume:volume). The headloss requirements require that the liquid loading rate be kept at less than 18 gpm/ft^2. With this loading rate, the required packing depth is calculated to be 17.5 ft. This tower design would yield theoretical removals of CCl_4, PCE and TCE of 97.5 percent, 97.0 percent, and 97.4 percent, respectively. If the cited removals were required for design, however, the tower height would have to be adjusted to provide a predetermined factor of safety, based on confidence limits about the calculated height of a transfer unit.

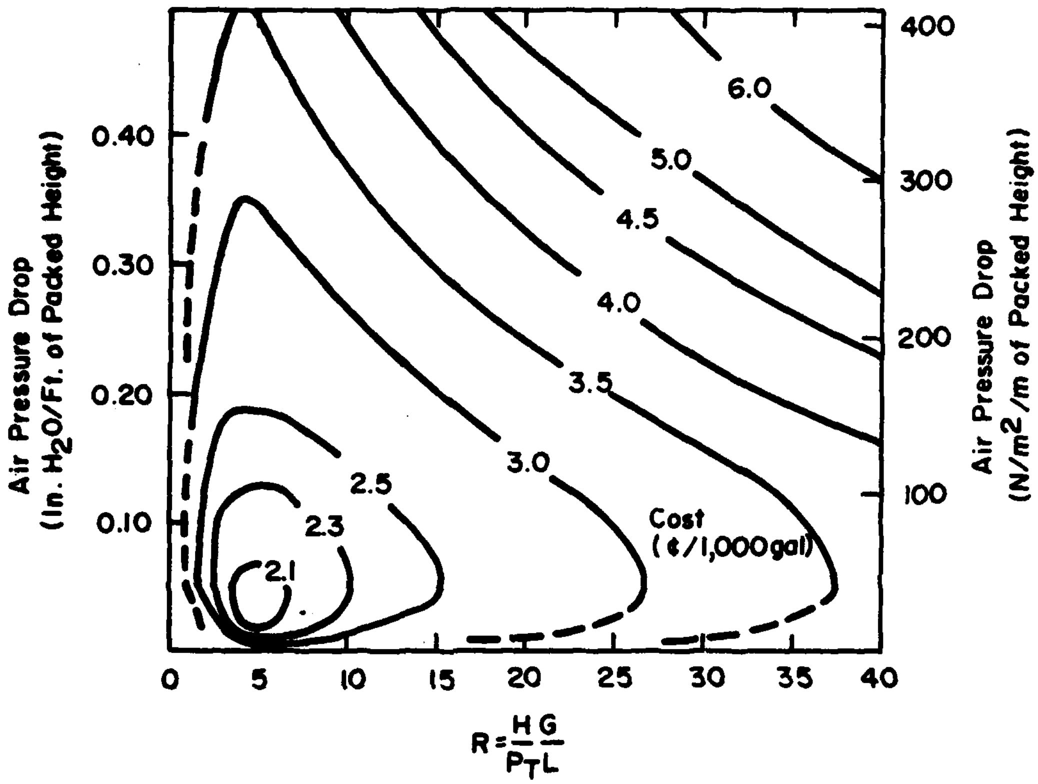
The results indicate the strong influence of operating costs on optimum design conditions. Sensitivity analysis indicates that the relative cost of power would have to decrease by almost eight times before headlosses above 0.06 in-H_2O/ft become justified. Care should, therefore, be taken that the tower diameter(s) be designed sufficiently large to ensure low headloss, and air flow should not be higher than necessary to meet the optimum stripping factor. It should also be noted that treatment costs increase rapidly for very low stripping factors, as the tower height increases dramatically to accomplish comparable removal.

SUMMARY

An air stripping design model has been applied to results from pilot studies conducted at the EEWTP, and design criteria for a packed tower have been generated. These design criteria represent the optimum tower design for achieving 97 percent chloroform removal at 20°C. This design will achieve equal or better removals of PCE, TCE, carbon tetrachloride and other highly volatile SOCs. Under extreme cold water conditions (6°C), removal can be expected to drop off to ninety percent for chloroform, with similar reductions for other compounds.

Results of the pilot run evaluation and tower design are summarized below.

1. Linear plots of NTU versus packing depth were generally quite effective in isolating pilot tower end effects and determining mass transfer coefficients.



RELATIVE COST (¢/1000 Gal)
CHLOROFORM, $X_i/X_o = 30$ (T = 20° C)
FIGURE I. 4-9

2. Mass transfer coefficients generally increased with liquid loading rate, as anticipated. For all compounds except bromoform, the Sherwood-Hollaway correlation provided a reasonably good means of relating mass transfer to liquid loading rate. Because of lower stripping factors, the results for bromoform were less certain, but seemed to show a poor fit to the correlation. Because the correlation does not account for gas-phase resistance to mass transfer, there is some possibility that it may not be appropriate for bromoform, which is the least volatile of the compounds studied. At the experimental conditions of this study, it was not possible to either confirm or disprove this hypothesis.

   Because of uncertainties in determination of Henry's constants, confidence in design predictions based on pilot study extrapolations are decreased at very low stripping factors (below two). The lower the stripping factor selected for design, the more important it becomes to develop accurate removal information through pilot operation at the specific conditions of design. Designs at stripping factors below two are not recommended.

3. There is an optimum tower design for any given application. For the application demonstrated here, the optimum design is at low tower pressure drops 0.06 in-H_2O/ft and at a stripping factor of approximately five. Operating costs dominated the selection. In general, appropriate stripping factors will lie between three and ten. Optimum pressure drops will generally be in the range of 0.012 to 0.06 in-H_2O/ft, with lower pressure drops indicated with increasing costs for energy.

SECTION 5

REVERSE OSMOSIS STUDY

BACKGROUND

INTRODUCTION

Reverse osmosis is one of several membrane processes finding increased use in the water and wastewater treatment industry. Considerable advances in membrane technology over the last decade have made reverse osmosis one of the most economical means of large scale demineralization of brackish and high salinity waters. The process is also being used more frequently for treatment of waste streams, chemical recovery and for preparation of ultrapure water for industrial applications.

The reverse osmosis unit was installed at the EEWTP to demonstrate the demineralization of a potentially high TDS raw water source. However, the process offered a number of other potential advantages, such as removal of natural and synthetic organic chemicals, trace metals, microorganisms, and inorganic salts, including sodium, nitrate, and ammonia. These potential process advantages may make reverse osmosis a viable process alternative for treating a contaminated source. Reverse osmosis is particularly attractive if revised modeling projections or changes in Blue Plains operation should indicate a greater need for removal of dissolved inorganic compound.

OBJECTIVES

The objectives of the EEWTP reverse osmosis study were two-fold: 1)to operate the 7 gpm sidestream system and develop baseline operating and water quality data necessary to evaluate its potential as an alternative advanced water treatment process, and 2) to determine the feasibility of reverse osmosis for removal of specific undesirable ionic species such as nitrate and sodium in the event that such removal is required for the full scale estuary plant.

APPROACH

THEORY

Reverse osmosis is the process of removing dissolved solids from solution by forcing the water, under pressure, through a semipermeable membrane. The membrane allows the passage of water from the solution, but rejects most larger molecules and ionic materials. Conceptually, reverse osmosis may be thought of as an analogous process to ultrafiltration. However, additional membrane transport mechanisms, many of which are not understood, contribute to removal.

The pressure required to permit passage of water through a membrane is a function of the osmotic pressure of the solution, which in turn is a function of the solute concentration. By definition, osmotic pressure is the pressure required to prevent the passage of a low concentration solvent through a membrane to the side of higher concentraion. In order to reverse this natural phenomenon, a pressure greater than the osmotic pressure must be applied to the high concentration side of the membrane before any flow through the membrane in a reverse direction will occur. For example, seawater has an osmotic pressure of approximately 400 psi. In order to get any flow to pass through the membrane from the seawater to the freshwater side, a pressure in excess of 400 psi must be applied to the seawater. (Membrane properties also affect flow requiring that the applied pressure be greater than the osmotic pressure.) The higher the applied pressure, the greater the flow and salt rejection. Reverse osmosis demineralization of seawater requires pressures on the order of 1,000 psi or greater. Fresh or brackish waters have considerably less osmotic pressure to overcome and, hence, may be operated at more economical operating pressures. As a general rule, the osmotic pressure increases by about 10 psi for every 1000 mg/L, TDS.

EXPERIMENTAL PLAN

In order to evaluate the feasibility of using reverse osmosis as an alternative process and obtain sufficient data to characterize product and reject water quality, a two and one-half month study of the 7 gpm sidestream reverse osmosis unit was conducted. The results of this study, as well as background information on the reverse osmosis system and testing program, are presented below.

METHODS

Reverse Osmosis System

The EEWTP reverse osmosis system was a skid mounted package unit consisting of an acid feed system, prefiltration unit, multiple stage high pressure feed pump and seven DuPont B-9 Polyamide hollow fiber reverse osmosis modules or permeators. Instrumentation for continuous monitoring of pH, electrical conductivity and automatic fault shutdown was also included. A sodium hexametaphosphate feed system was installed prior to start-up of the unit. Details concerning equipment, performance criteria and membrane specifications can be found in Table I.5-1. Figure I.5-1 is a schematic of the reverse osmosis system.

Operations

The reverse osmosis system was operated for approximately eighty days, from mid December 1982 to early March 1983. A summary of the operating conditions used during this study is presented in Table I.5-2. Details concerning operation of the system are presented below.

Module Configuration. As outlined in Table I.5-2, a three stage permeator configuration was used during the study which yielded an approximate product

TABLE I.5-1

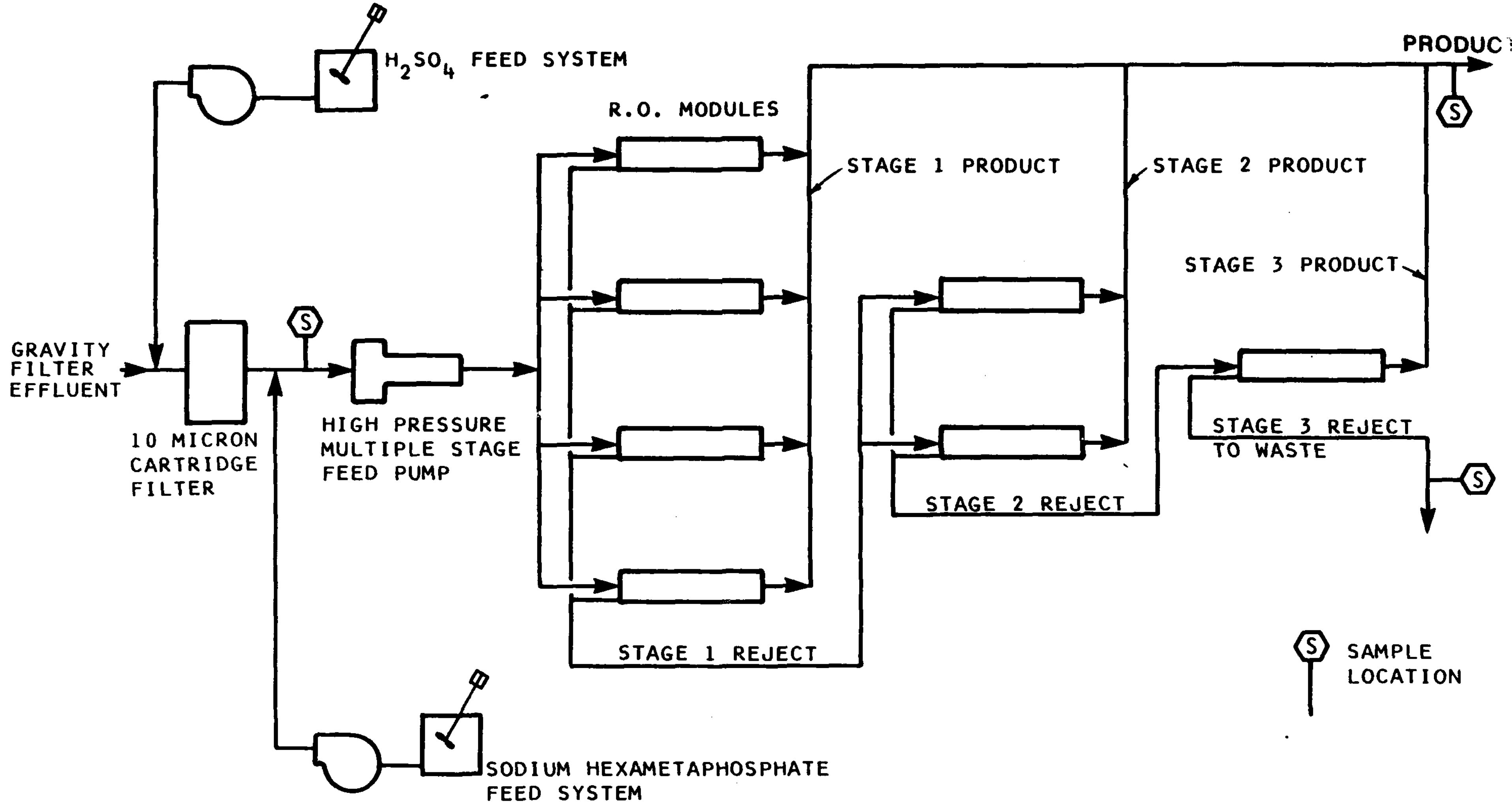
REVERSE OSMOSIS SYSTEM DESIGN CRITERIA AND EQUIPMENT SPECIFICATIONS

General Performance Criteria	
Design Feed Flow	0.44 l/s (7.0 gpm)
Minimum Product Water Recovery	75% @ 10°C, 3450 kPa (500 psig)
Minimum Salt Rejection	90%
Operating Pressure	
Max	4,140 kPa (600 psig)
Operating	2,760 kPa (400 psig)
Temperature Range	1.7 to 32°C
pH Range	4 to 11
Reverse Osmosis System Equipment	
Acid Feed System	
H_2SO_4 Dilution Tanks	
Number	2 (1 standby)
Capacity	190 l (50 gal)
Pump	
Type	Positive Displacement
Capacity	26 ml/s (25 gph)
Sodium Hexametaphosphate	
Dilution tank	
Number	1
Capacity	95 L (25 gal)
Pump	
Type	Positive Displacement
Capacity	1.6 ml/s (1.5 gph)
Pre Filtration System	
Type	10 micron wound fiber cartridge
High Pressure Feed Pump	
Type	Multiple State Centrifugal
Capacity @ 305 m (1000 ft) TDH	0.54 L/s (8.5 gpm)
Motor Power	5.6 kW (7.5 hp)
Membrane Modules	
Number	7
Membrane Type	B-9
Membrane Configuration	Hollow Fiber
Shell Dimensions	13.3 cm ODx11.7 cm IDx63.5 cm (5 1/4" OD x 4 5/8" ID x 25")
Shell Material	Filament-wound Fiberglass Epoxy
Initial Product Water Capacity	0.092 L/s (1.46 gpm)
Salt Passage	<10%

TABLE I.5-1 (Continued)

REVERSE OSMOSIS SYSTEM DESIGN CRITERIA
AND EQUIPMENT SPECIFICATIONS

Rated Operating Pressure	2760 kPa (400 psig)
Temperature Range	1.7 to 32°C
pH Range, continuous exposure	4 to 11
Minimum Concentrate Rate	0.07 L/s (1.11 gpm)
Maximum Concentrate Rate	0.21 L/s (3.33 gpm)
Clean-In-Place System	
Cleaning Solution Batch Tank	
Capacity	284 L (75 gal)
Cleaning Solution Recycle Pump	
Type	Centrifugal
Motor Power	2.2 kW (3 hp)



REVERSE OSMOSIS SYSTEM
FIGURE I. 5-1

TABLE I.5-2

REVERSE OSMOSIS SYSTEM OPERATING CONDITIONS

System Configuration	
Approximate Product Recovery	75%
Staging	
Number	3
Modules per Stage	
Stage 1	4
Stage 2	2
Stage 3	1
Feed Water Source	
Line Clarified and Gravity Filtered Blend of Nitrified WWTP Effluent and Potomac Estuary Water	
Turbidity (TYP)	0.2 NTU
Hardness	200 - $CaCO_3$
Pretreatment	
pH Control	
Feed Water Target	6.0 with diluted H_2SO_4
Prefiltration	10 Micron Wound Catridge
Scale Inhibitor	
Type	Sodium Hexametaphosphate
Dose Range	5 to 10 mg/L
Typical System Operating Conditions	
Feed Flow	0.44 L/s (7.0 gpm)
Reject Flow	0.11 L/s (1.75 gpm)
Product Flow	Variable
Operating Pressure (1st Stage Feed)	2,410 kPa (350 psig)
Post Treatment	
None	

recovery factor of 75 percent. The reverse osmosis feed was introduced into four first stage permeators; the reject from these was fed into the two second stage permeators and the second stage reject served as the feed to the third stage permeator. The highly concentrated third stage reject was then piped to a sanitary sewer. Product water from each of the three stages was blended.

Feed Water Source. The feed to the reverse osmosis system was a lime clarified and filtered process water. The feed was piped to the reverse osmosis unit from the high pressure feed line to the GAC columns (gravity filter effluent). Flow to the reverse osmosis unit was not interrupted for any significant time period during the study. However, the nitrified effluent source was out of service for the first twenty three days of February 1983. Water quality data on the reverse osmosis system feed is presented below in the "Performance" section.

Pretreatment. Reverse osmosis membranes are susceptible to scaling and fouling by colloids, metal oxides and microorganisms and, therefore, proper treatment of the feed water is required. To inhibit scale and metal oxide formation, the pH of the feed water was reduced to 6.0 with dilute sulfuric acid, and sodium hexametaphosphate, a complexing agent, was added at 10 mg/L. Suspended particulates in the feed flow were removed by a 10 μm wound fiber cartridge filtration unit. The prefilter units performed exceptionally and cartridges did not require changing throughout the entire study period.

System Operating Conditions. Because examination of water quality was the goal of the study (as opposed to optimizing water production), the unit was operated at a constant first stage feed pressure of 350 psi and a constant reject flowrate of 1.75 gpm. Plant operators maintained the proper operating conditions and recorded specified operating data every two hours.

Post-Treatment. Post-treatment of product water was not practiced during the study period. However, in full-scale, some post-treatment would be necessary to reduce the corrosiveness of the low pH, unbuffered product. Post-treatment requirements would include CO_2 removal by air stripping and additional pH adjustment with lime or caustic.

Membrane Cleaning System. The reverse osmosis system did not operate long enough to require membrane cleaning. The pretreatment systems apparently preconditioned the water sufficiently to prevent chemical and microbiological fouling problems for the 80 day duration of the study.

Sampling Program. The reverse osmosis sampling program schedule is presented in Table I.5-3. This table shows the type, frequency and duration of sampling and the locations sampled. The most intensive sampling occurred during the first eight weeks of operation from mid-December 1982 through mid-February 1983. This was done in an attempt to collect as much data as possible early in the study in case an unforeseen operational problem such as severe membrane fouling developed causing shutdown of the unit.

TABLE I.5-3

REVERSE OSMOSIS SAMPLING PROGRAM SCHEDULE

Parameter	Sample Type(s)	Frequency	Approximate Duration	Sites Sampled: Feed	Sites Sampled: Product	Sites Sampled: Reject
Inorganic						
Anions	24 Hour Composite	1/Week	8 Weeks	X	X	X
Cations	24 Hour Composite	1/Week	8 Weeks	X	X	X
Electrical Conductivity	Continuous/Grab	1/Day	11 Weeks	No/X	X/X	No/X
pH	Continuous/Grab	1/Day	11 Weeks	X/X	No/X	No/X
Trace Metals	24 Hour Composite	1/Week	8 Weeks	X	X	X
Organic						
TOC	Grab	5X/Week	9 Weeks	X	X	X
TOX	Grab	2X/Week	8 Weeks	X	X	X
TTHMFP	Grab	Varied	—	X	X	No
LLE Factor	Grab	2X/Week	8 Weeks	X	X	X
Microbiological						
SPC	Grab	2X/Week	8 Weeks	X	X	X

DISCUSSION OF RESULTS

This section describes the performance of the reverse osmosis system with respect to water quality. Its intent is to describe the removals of a wide variety of water quality constituents by reverse osmosis and to characterize the concentrated waste stream. Prior to discussion of water quality a brief description of water production is provided.

PRODUCTION

Reverse osmosis membranes are temperature sensitive and capacities are directly proportional to the temperature. For example, if the initial capacity of the B-9 polyamide membranes used at the EEWTP are normalized so that production at 25°C equals unity, then capacity would range from 0.55 at 5°C to 1.34 at 35°C. The effect of temperature on product recovery is illustrated in Figures I.5-2 and I.5-3. These figures show the correlation of percent of product recovery and feed water temperature. As discussed previously, the operating pressure and reject rate were constantly maintained and the product flow was allowed to fluctuate according to temperature. If, however, a production goal was the objective, pressures would have to be increased in proportion to the temperature change. This illustrates the fact that the cost of reverse osmosis is dependent on water temperature.

WATER QUALITY PERFORMANCE

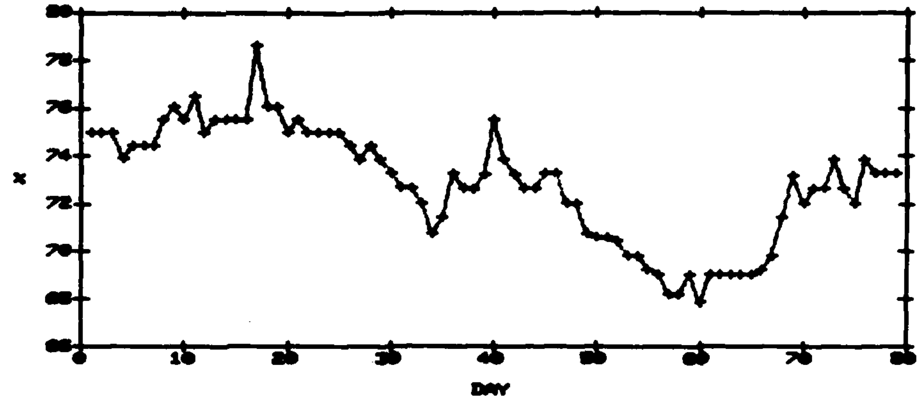
This section presents the results of inorganic, organic and microbiological testing of the reverse osmosis system. The breakdown of specific parameters analyzed are as follows:

- Inorganic Parameters
    - Major cations
    - Anions
    - Nutrients
    - Trace metals

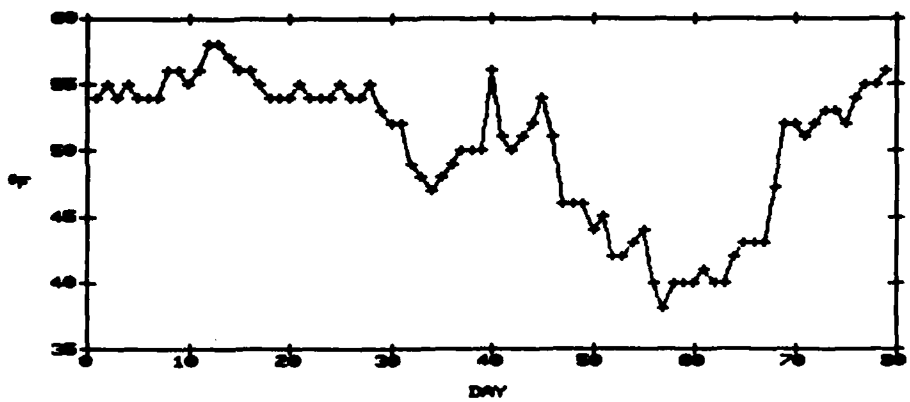
- Organic Parameters
    - Surrogate Parameters
        - total organic carbon (TOC)
        - total organic halide (TOX)
        - total trihalomethane formation potential (THMFP)
    - Volatile organic compounds, LLE fraction

- Microbiological Parameters
    - Standard plate count bacteria (SPC)

The majority of the water quality data is presented in tabular form. The standard table format includes the number of samples collected, the number above the minimum quantification limit and the geometric mean values of the feed and product water. Also included is the percent removal from feed to product as measured by the geometric mean, with the corresponding 95 percent confidence intervals. Because the reverse osmosis reject flow represents a



PERCENT OF FEED FLOW RECOVERY
FIGURE I. 5-2



RO FEEDWATER TEMPERATURE
FIGURE I. 5-3

source of pollution which must be dealt with, the geometric mean values of the samples analyzed is also presented. In most cases, the number of reject samples analyzed is equivalent to the number of feed or product analyses.

Inorganic Parameters

Major Cations, Anions, and Nutrients. Concentration and removal data for major cations, anions, and nutrients is presented in Table I.5-4. The parameters of greatest concern in this category are sodium, nitrate and total dissolved solids. Removal of each of these exceeded ninety percent. The relatively narrow 95 percent confidence intervals indicate good removal reliability.

Ammonia was also of special concern because of full-scale operating problems with disinfection, as discussed in Chapter 7 of this report. These data show that ammonia removal by the polyamide membranes was very erratic, and at times ammonia was generated. This was probably due to the extremely low levels of ammonia in the reverse osmosis feed. Levels at all sites were less than 0.5 mg/L and three of eight influent samples were below the detection limit of 0.02 mg/L. At these low concentrations it is difficult to assess removal and impossible to define reliability.

Electroconductivity. Electroconductivity (EC) is a measure of the total dissolved solids content in water and, therefore, is often used as a surrogate parameter for TDS. Electroconductivity was monitored continuously by instrumentation included with the reverse osmosis package and by daily grab samples. Figure I.5-4 shows the feed and product EC concentrations, and Figure I.5-5 shows the percent rejection of the electroconductivity in the reverse osmosis feed. The average concentration of electrical conductivity in the feed, product and reject were 485, 25 and 1,550 μmhos, respectively.

Trace Metals. Trace metal removal data is presented in Table I.5-5. The concentrations of trace metals in the reverse osmosis feed were extremely low due to prior sedimentation and filtration under the lime mode. Arsenic, cadmium, lead, mercury, silver and titanium were below their respective detection limits in the reverse osmosis feed water. At these low concentrations and with so few samples detected, removal and reliability could not be assessed.

Organic Parameters

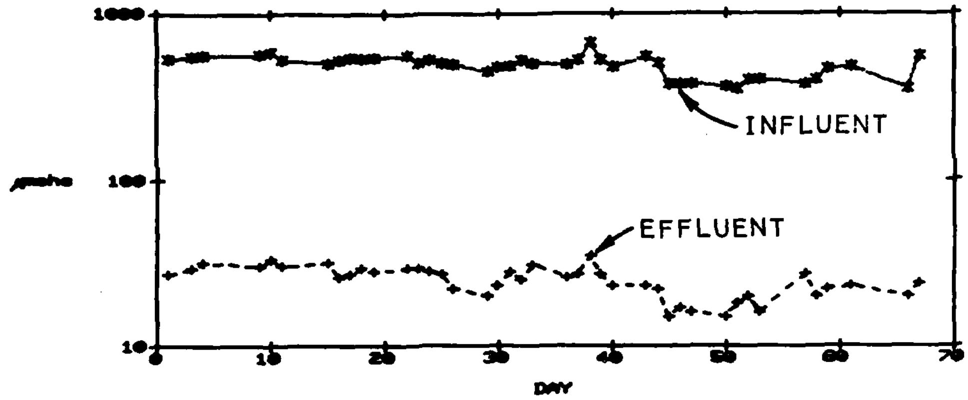
Total Organic Carbon. Over eighty percent removal of TOC was observed during the study. As shown in Table I.5-6, geometric mean values in the feed and product water were 3.03 and 0.59 mg/L-C, respectively. The 95 percent confidence interval illustrates that TOC removal was consistent. The geometric mean TOC value of the reject was 8.72 mg/L. Figure I.5-6 shows a time series plot of TOC in the reverse osmosis feed end product. The decrease in feed water TOC after day forty of operation corresponds to the time when the nitrified effluent was out of service and all plant flow was from the estuary.

TABLE I.5-4

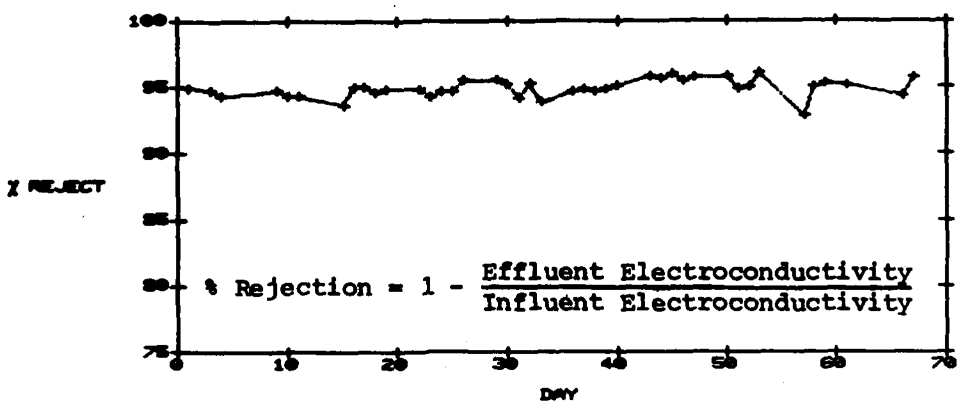
REVERSE OSMOSIS DATA - ANIONS, CATIONS AND NUTRIENTS

Parameter	Feed			Product				95% Confidence Interval		Reject
	Number Sampled	Number Quantified	Geometric Mean	Number Sampled	Number Quantified	Geometric Mean	Percent Removal	Lower	Upper	Geometric Mean
Alkalinity MDL = 2.7 mg/L-$CaCO_3$	7	7	34.9	7	7	11.0	68.5	52.5	79.1	75.3
Bromide MDL = 0.003 mg/L	7	1	NC[1]	7	1	NC	NC	—	—	0.0002
Calcium MDL = 0.2 mg/L	8	8	71.9	8	8	1.08	98.5	97.8	98.98	259.11
Chloride MDL = 0.1 mg/L	7	7	49.6	7	0	NC	NC	—	—	174.6
Flouride MDl = 0.01 mg/L	7	7	0.4	7	3	NC	NC	—	—	1.16
Magnesium MDL = 0.1 mg/L	8	8	6.0	8	7	0.12	98.1	96.1	99.0	20.90
Potassium MDL = 0.3 mg/L	8	8	5.0	8	7	0.55	88.9	80.6	93.6	16.66
Silica MDL = 0.2 mg/L	7	7	5.7	7	0	NC	NC	—	—	18.50
Sodium MDL = 0.1 mg/L	8	8	30.9	8	7	2.06	93.3	79.2	97.9	106.87
Sulface MDL = 0.6 mg/L	7	7	137.5	7	1	NC	NC	—	—	449.06
Total Dissolved Solids MDL = 1.0 mg/L	7	7	337.2	7	6	4.66	98.6	96.8	99.4	1096.71
Ammonia MDL = 0.02 mg/L-N	7	5	0.051	7	6	0.087	-70.6	-1,229	78.1	0.117
Nitrite & Nitrate MDL = 0.02 mg/L	7	7	5.64	7	5	0.13	97.7	84.1	99.7	14.67
Total Kjeldahl Nitrogen MDL = 0.2 mg/L-N	7	7	0.83	7	7	0.41	50.4	-4.2	76.4	1.20
Orthophosphate MDL = 0.01 mg/L-P	7	7	0.10	7	1	NC	NC	—	—	0.31

1. NC = not calculated, less than



ELECTROCONDUCTIVITY IN
REVERSE OSMOSIS FEED AND PRODUCT
FIGURE I. 5-4



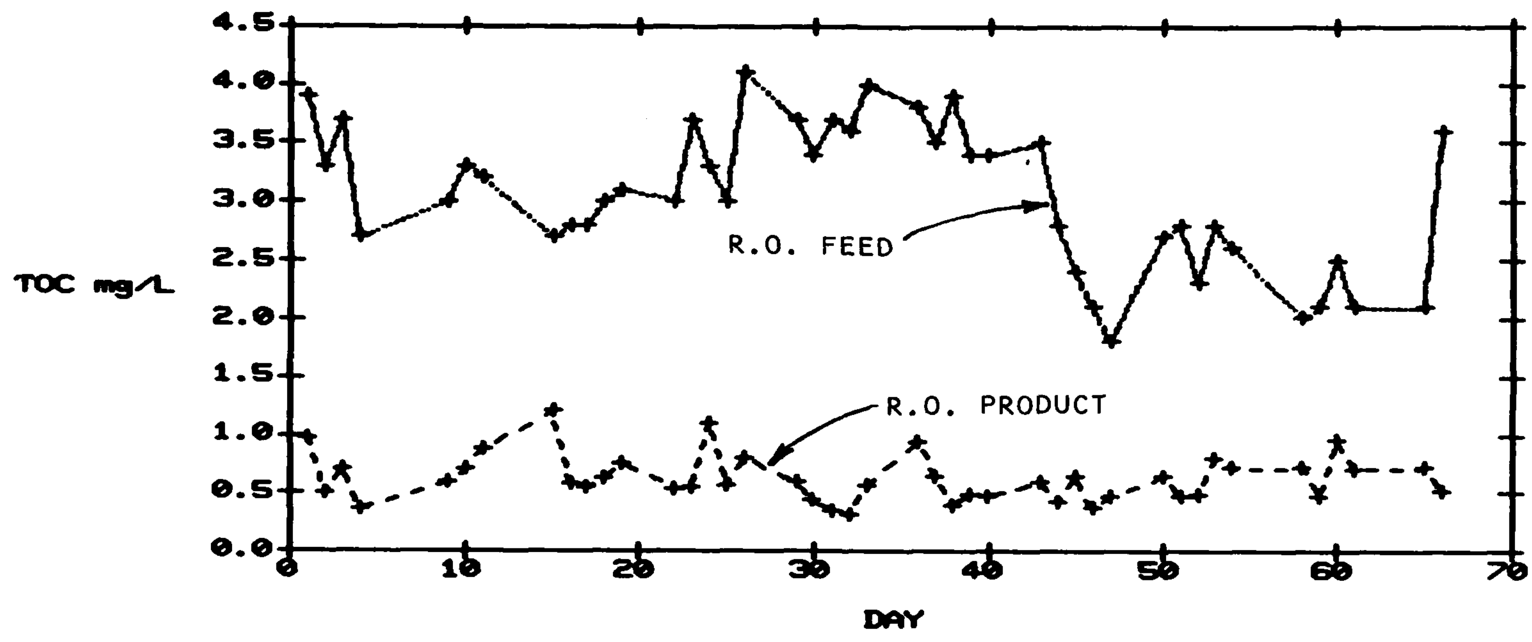
ELECTROCONDUCTIVITY - % REJECTION
FIGURE I. 5-5

TABLE I.5-5

REVERSE OSMOSIS DATA - TRACE METALS
(mg/L)

	Feed			Product				95% Confidence Interval		Reject
Parameter	Number Sampled	Number Quantified	Geometric Mean	Number Sampled	Number Quantified	Geometric Mean	Percent Removal	Lower	Upper	Geometric Mean
Aluminum MDL= 0.003 mg/L	7	5	0.009	7	4	—	NC[1]	—	—	0.013
Barium MDL=0.002 mg/L	7	7	0.015	7	0	NC	NC	—	—	0.048
Boron MDL=0.0040 mg/L	7	7	0.044	7	5	0.006	88.6	61.7	94.5	0.152
Chromium MDL=0.0002 mg/L	7	7	0.003	7	5	0.0004	83.97	24.1	96.6	0.003
Copper MDL=0.0012 mg/L	7	6	0.003	7	1	NC	NC	—	—	0.010
Iron MDL=0.003 mg/L	7	6	0.019	7	6	0.007	62.3	-41.0	90.0	0.080
Lithium MDL=0.0004 mg/L	7	7	0.005	7	5	0.0006	86.7	70.0	94.2	0.017
Manganese MDL=0.0010 mg/L	7	7	0.007	7	1	NC	NC	—	—	0.041
Nickel MDL=0.0010 mg/L	7	3	0.001	7	1	NC	NC	—	—	0.008
Selenium MDL=0.0002 mg/L	7	5	0.0004	7	3	0.0002	63.1	-75.6	92.3	NC
Vanadium MDL=0.0020 mg/L	7	4	0.002	7	0	NC	NC	—	—	0.014
Zinc MDL=0.0012 mg/L	7	7	0.004	7	3	0.001	71.1	12.4	90.5	0.014

1. NC = Not Calculated, Less Than 15% of Samples Were Quantified.



R.O. FEED AND PRODUCT TOC CONCENTRATIONS
FIGURE I. 5-6

Total Organic Halide. Total organic halide (TOX) is a surrogate parameter used to assess the concentration of halogenated organics in water. TOX removal is also summarized in Table I.5-6. The results indicate that TOX was reduced below the detection limit of 3.9 µg/L-Cl in all but one of the 14 product water samples. This implies that most of the halogenated organics in the process water were of high molecular weight possibly exceeding 200, the manufacturer's cited molecular weight for rejection of organics by reverse osmosis.

Trihalomethane Formation Potential (THMFP). The results of several THMFP tests are presented in Table I.5-7. The data show that the reverse osmosis system was capable of removing most of the THM precursor material present in the feed water. Terminal THM levels in the reverse osmosis product were slightly over 3 µg/L, whereeas seven day THM values of the feed water were in excess of 100 µg/L. Figure I.5-7 illustrates the results of the THMFP tests.

The THMFP tests were conducted at 25°C and a free chlorine residual was maintained throughout the test period. The pH of the test samples was not adjusted and ranged from 5.0 to 8.0. Details concerning the testing protocol can be found in Section 8 of this appendix.

Volatile Organic Compounds - LLE Fraction. Table I.5-8 summarizes the results of analyses performed for volatile organic compounds at the three reverse osmosis sampling sites. Significant removals of chloroform and tetrachloroethene were observed.

Microbiological

Table I.5-9 presents the results of approximately twenty-five Standard Plate Count Bacteria (SPC) assays conducted on feed, product and reject water samples. The data show that approximately fifty percent removal through the unit was consistently achieved.

No disinfection was used before or after reverse osmosis treatment and biological fouling was not observed during operation.

TABLE I.5-6

REVERSE OSMOSIS
TOC AND TOX SUMMARY

	TOC (mg/L-C)	TOX (mg/L-Cl)
RO Feed		
Number	39	16
Number Quantified	39	15
Geometric Mean	3.03	67.7
RO Product		
Number	39	14
Number Quantified	39	1
Geometric Mean	0.59	NC
Percent Removal		
Based on Geometric Mean	80.4	>90
Lower 95% CI	77.9	NC
Upper 95% CI	82.7	NC
RO Reject Water	8.72	282

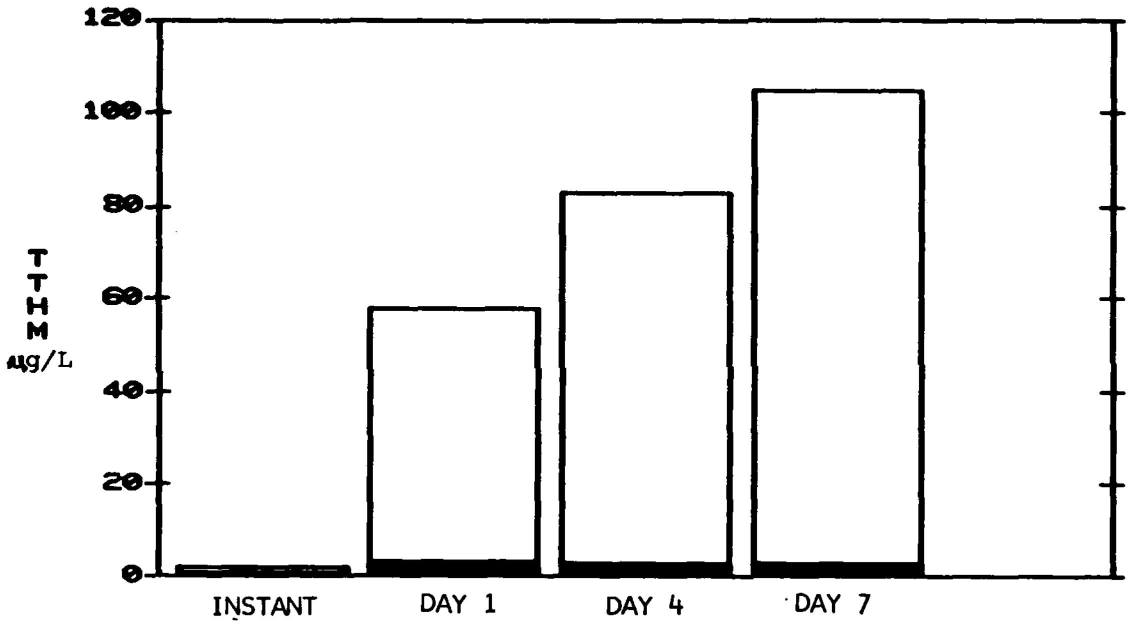
1. NC = Not Calculated

TABLE I.5-7

SUMMARY OF REVERSE OSMOSIS TOTAL TRIHALOMETHANE FORMATION POTENTIAL TESTING

Statistic	Initial TTHMS	Day 1 TTHMS	Day 4 TTHMS	Day 7 TTHMS
R.O. Feed				
N[1]	7	4	3	7
Arithmetic Mean (µg/L)	2.1	58	83	105
Std. Dev. (µg/L)	1.07	11.7	20.8	16.7
R.O. Product				
N	6	4	3	7
Arithmetic Mean (µg/L)	1.1	3.3	3.1	3.1
Std. Dev. (µg/L)	0.66	2.15	0.80	1.37

1. N = Number of Samples.



TOTAL TRIHALOMETHANE FORMATION POTENTIAL IN REVERSE OSMOSIS FEED AND PRODUCT WATER

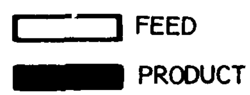


FIGURE I. 5-7

TABLE I.5-8

SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED BY LLE-ECD

	Feed			Product				95% Confidence Interval		Reject
Trace Metals (mg/L)	Number Sampled	Number Quantified	Geometric Mean	Number Sampled	Number Quantified	Geometric Mean	Percent Removal	Lower	Upper	Geometric Mean
Total Trihalomethanes	16	16	2.45	16	15	1.192	51.3	24.8	68.5	6.008
Chloroform	16	16	1.940	16	15	1.146	40.9	15.9	58.5	4.475
Carbon Tetrachloride	16	4 @ MDL[1]	NC[2]	16	4 @ MDL	NC	NC	NC	NC	NC
Bromochloromethane	16	16	0.397	16	0	NC	724.4	NC	NC	0.969
Tetrachloroethene	16	15	0.541	16	14	0.324	40.1	7.5	61.2	1.251
Bromoform	16	0	NC	16	1	NC	NC	NC	NC	NC
Trichloroethene	16	8	NC	16	0	NC	NC	NC	NC	0.267
Dibromochloromethane	16	15	0.170	16	8	0.135	20.7	-13.1	44.4	0.389

1. MDL = Method Detection Limit
2. NC = Not Calculated

TABLE I.5-9

REVERSE OSMOSIS
STANDARD PLATE COUNT SUMMARY

RO Feed	
Number	27
Number Quantified	27
Geometric Mean (colonies/ml)	264.8
RO Product	
Number	25
Number Quantified	25
Geometric Mean (colonies/ml)	118.9
Percent Removal	
Based on Geometric Mean	55.1
Lower 95% CI	16.9
Upper 95% CI	75.7
RO Reject Water	2,501

CONCLUSIONS AND RECOMMENDATIONS

The short term test of the polyamide hollow fiber RO process demonstrated that this RO unit could effectively reduce the levels of most problem water quality parameters to levels acceptable for human consumption. Notably, sodium and nitrate levels were reduced below their corresponding recommended (sodium) or regulated (nitrate) MCLs.

The process also showed a marked effect on reduction of total organic halide, a surrogate parameter measuring the level of some organic compounds of health significance. Levels of this parameter were reduced below detection limits in all samples.

No attempts were made to address several important design issues which will arise if the RO process should be required in a full-scale estuary water treatment plant. Some of these issues include:

- membrane life
- post treatment for adjustment of pH and corrosion potential
- optimum configuration of the permeator modules
- optimum operating pressure
- the effect of temperature on the removal of individual parameters
- brine disposal alternatives

Based on the results of the monitoring program, however, the RO process is a feasible unit process for control of sodium, nitrate, TDS, and high molecular weight organic compounds, and most other parameters of concern. The polyamide membranes did not appear capable of controlling ammonia, however.

Should it be necessary to use a dimeneralization process in the estuary water treatment for control of specific inorganic contaminants, the RO process using polyamide fiber membranes would be a costly but technically feasible solution. Preliminary estimates of cost are provided in Chapter 11.

SECTION 6

QUALITATIVE STUDY OF COMPOUNDS ADSORBED BY PLANT-SCALE GAC COLUMNS

BACKGROUND

INTRODUCTION

One of the principal roles of the granular activated carbon columns at the EEWTP was to provide a barrier against potential synthetic organic chemicals (SOCs) which might be present in the influent water to the plant. There is particular concern with respect to the presence of such compounds when the source waters are contaminated with wastewater, as discussed in Chapter 1 and Chapter 9 (Section 7) of this report. Monitoring at the EEWTP for these SOCs was conducted at the GAC influent, intermediate, and GAC effluent sites in an effort to evaluate which compounds were present in the gravity filter effluent and how effectively they were removed by the GAC. Twenty-four hour composite samples were taken on a biweekly or triweekly basis (dependent on fraction), with the exception of the seven compounds monitored via liquid/liquid extraction GC, which were analyzed twice-a-week.

In addition to the general issue of SOCs which cannot be identified by current analytical techniques (see Chapter 9), there was some concern that spikes of identifiable compounds were present in the influent water, but not detected with the frequency of sampling used. Also, there is the probability that there were compounds present in low concentrations (below analytical detection limits) in the influent and were being adsorbed by the GAC columns where they were stored in the carbon particles.

OBJECTIVE

The objective of this study was to identify the SOCs which were adsorbed onto the lead and lag GAC columns.

APPROACH

EXPERIMENTAL PLAN

At the end of Phase IA operation in March 1982, three carbon samples were collected and shipped to the UNC laboratory in Chapel Hill. The three samples represented once regenerated Hydrodarco 816 lignite based carbon, each of which had been subjected to different degrees of usage, as listed below.

Qualitative Study of Compounds Adsorbed
By Plant-Scale GAC Columns

1. Unused single regeneration.
2. Utilized for seven months in the lag carbon column since regeneration.
3. Utilized for seven months in the lead carbon column since regeneration.

TOC removal after seven months had dropped approximately twenty percent at apparent steady state. Thus, the GAC was nearly exhausted with respect to TOC adsorption.

METHODS

The methods utilized for extraction and analysis of the organics from the GAC were developed by the Department of Environmental Sciences and Engineering at the University of North Carolina (UNC) at Chapel Hill (Millington, 1982). Techniques using both solvent extraction and thermal desorption were applied, with identification by GC/FID and GC/MS. All compound identifications were confirmed by comparison of the mass spectra and retention indices with standards run on the system. Because extraction efficiencies had not been determined at the time of the analysis, quantitation of substances recovered was not possible. Further description of the analytical techniques is provided below.

The soxhlet method requires a 60 g sample of GAC and selected solvents. In the soxhlet method, a soxhlet apparatus which contains a solvent and the carbon sample is used to extract the organic compounds. Three solvents are used in the following order: acetone/methylene chloride/toluene. Extracts from this technique are concentrated to 1 ml using the KD concentration apparatus and these concentrates are injected into the GC/MS for analysis.

The thermal desorption method uses the Unacon model 780B concentrating/inletting system (envirochen). A 0.5 g sample is placed in a glass tube and inserted into the instrument whereby it is heated to 300°F over a thirty minute duration and desorbed onto an efficient trap containing selective adsorbants. Some of the material is then purged onto the head of a capillary GC column which is connected directly to the MS for analysis.

DISCUSSION OF RESULTS

The results from the extraction and analysis of the three carbons are summarized in Table I.6-1. The study was able to isolate and identify twenty-six compounds in the lead column, seventeen of which were also present in the lag carbon column. Ten compounds were identified, which had not been previously found with the analytical techniques and sampling frequencies employed during plant monitoring. Eight of these were present in the lag column as well as the lead.

It is important to note that the unused regenerated carbon sample did not contain appreciable amounts of substances besides those which were accounted for by the solvents themselves, as determined by analysis of blank solvent extraction. Therefore, the compounds listed in Table I.6-1 are only those seen

in the used carbons which were not in the unused regenerated carbon. Some peaks were seen in the chromatograms which could not be identified by comparison to standards or to spectra library. Copies of the mass spectra of these unidentified compounds are provided in Figure I.6-1.

SUMMARY AND CONCLUSIONS

This qualitative study was conducted to gain further understanding of the nature of the organic compounds which accumulated on the GAC filter beds and the effectiveness of GAC in removing organic pollutants from the influent water. The results indicate that GAC was effective to some degree in removing at least twenty-six specific synthetic organic chemicals.

Ten chemicals were identified which had not been previously identified, either tentatively or confirmed, in the EEWTP influent waters. The compounds were most likely present in concentrations below analytical detection limits, and were concentrated and stored over time by the carbon. It is also possible, however, that spikes of these compounds may have passed through the plant unnoticed (i.e., not sampled), or that the compounds were formed on the carbon through reactions between compounds in the water and/or the carbon.

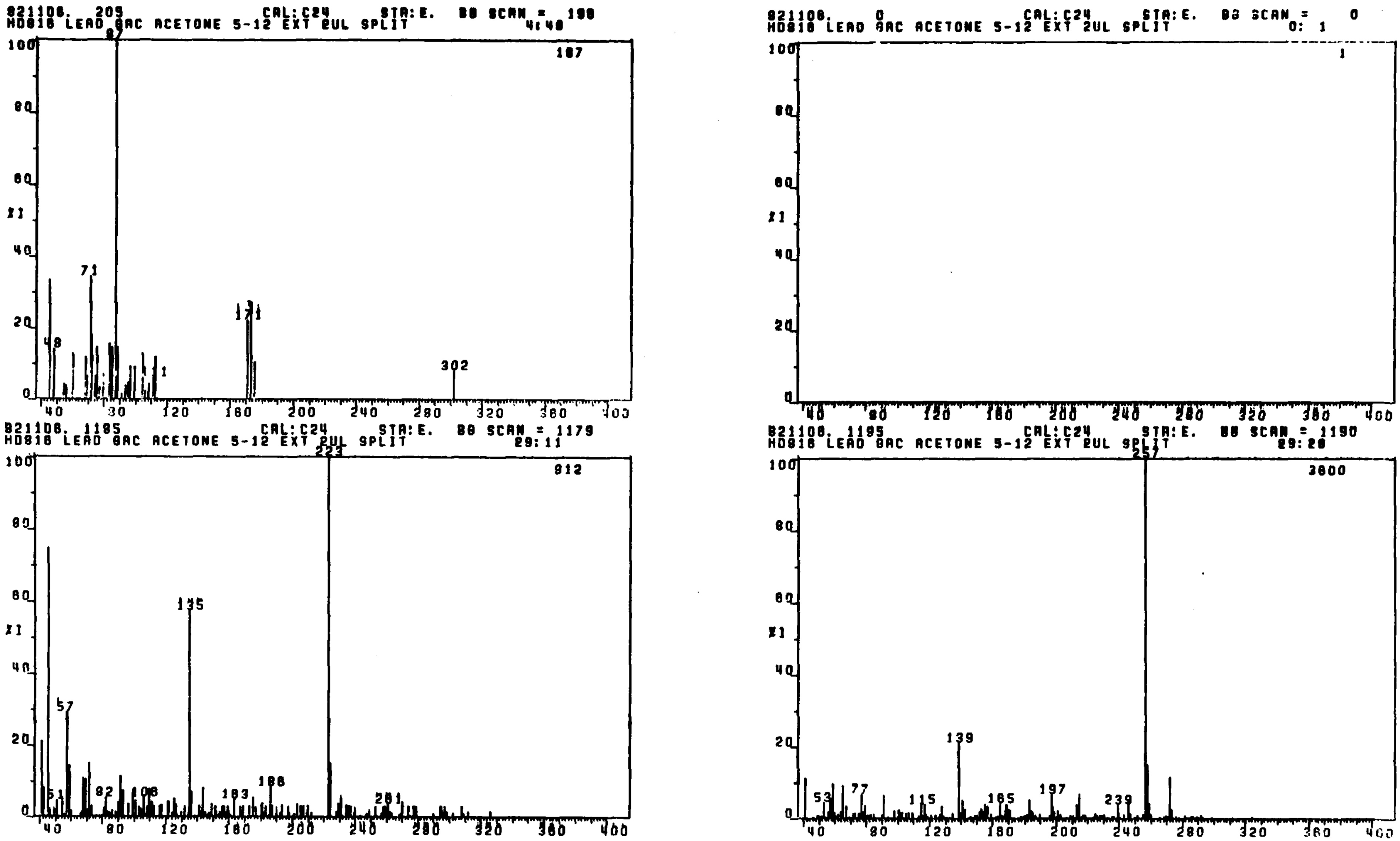
In any event, it is unlikely that chronic doses of any of the additional detected compounds were sufficiently high to be of health concern and the results of this study did not alter the evaluation of EEWTP finished water quality, as discussed in Chapter 9.

TABLE I.6-1

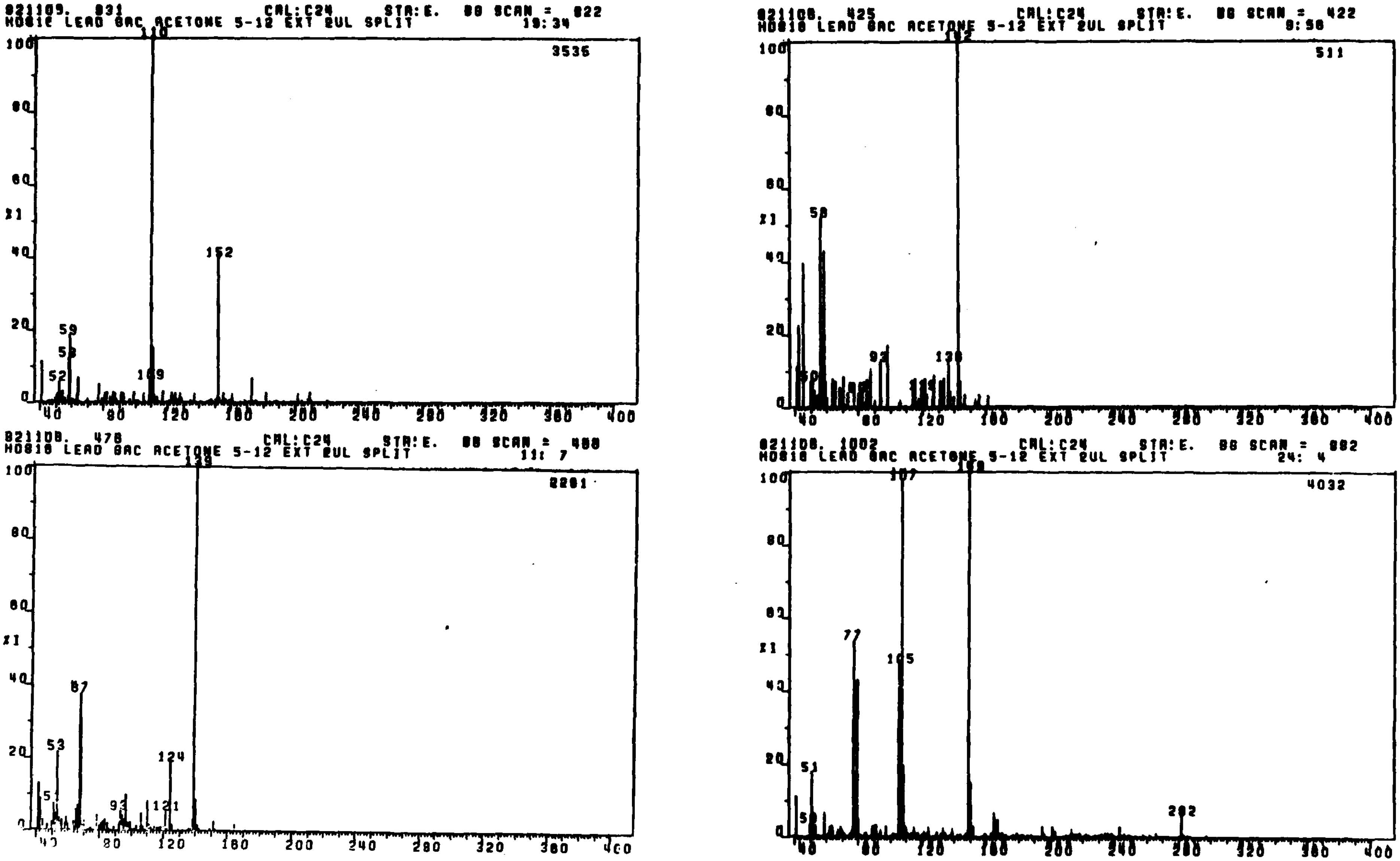
COMPOUNDS[1] EXTRACTED FROM GRANULAR ACTIVATED CARBON SAMPLES

Compound	Identified in Carbon Samples: Extracted from Lead Column Carbon	Identified in Carbon Samples: Extracted From Lag Column Carbon	Detected in EEWTP Sample Analysis (Phase IA): Pre-GAC Sites	Detected in EEWTP Sample Analysis (Phase IA): Post-GAC Sites
Chloroform	X[1]	X	X	X
Dibromochloromethane	X	X	X	X
Bromodichloromethane	X	X	X	X
Dichloroiodomethane	X	X	X	X
Bromoform	X	X	X	X
Bromochloroiodo-methane	X	X	—[2]	—
Tetrachloroethylene	X	X	X	X
Chlorobenzene	X	—	X	X
Dichlorobenzene isomers	X	—	X	X
Trichlorobenzene	X	—	X	X
Ethyl benzene	X	X	X	X
C_3-alkylbenzenes	X	—	X	X
C_4-alkylbenzenes	X	—	X	X
Benzaldehyde	X	X	—	—
Xylene isomers	X	X	X	X
Cresol isomer	X	X	—	—
Naphthalene	X	X	X	X
Dimethylnaphthalene isomers	X	—	X	—
Methylnaphthalene isomers	X	—	X	—
Benzonitrile	X	—	—	—
Benzophenone	X	—	—	—
Acetophenone	X	X	—	—
Tributyl phosphate	X	X	—	—
Tris-chloroethyl phosphate	X	X	—	—
Tris-butoxyethyl phosphate	X	X	—	—
Diethyl phthalate	X	—	X	X
p-Toluenesulphonamide[3]	X	X	—	—

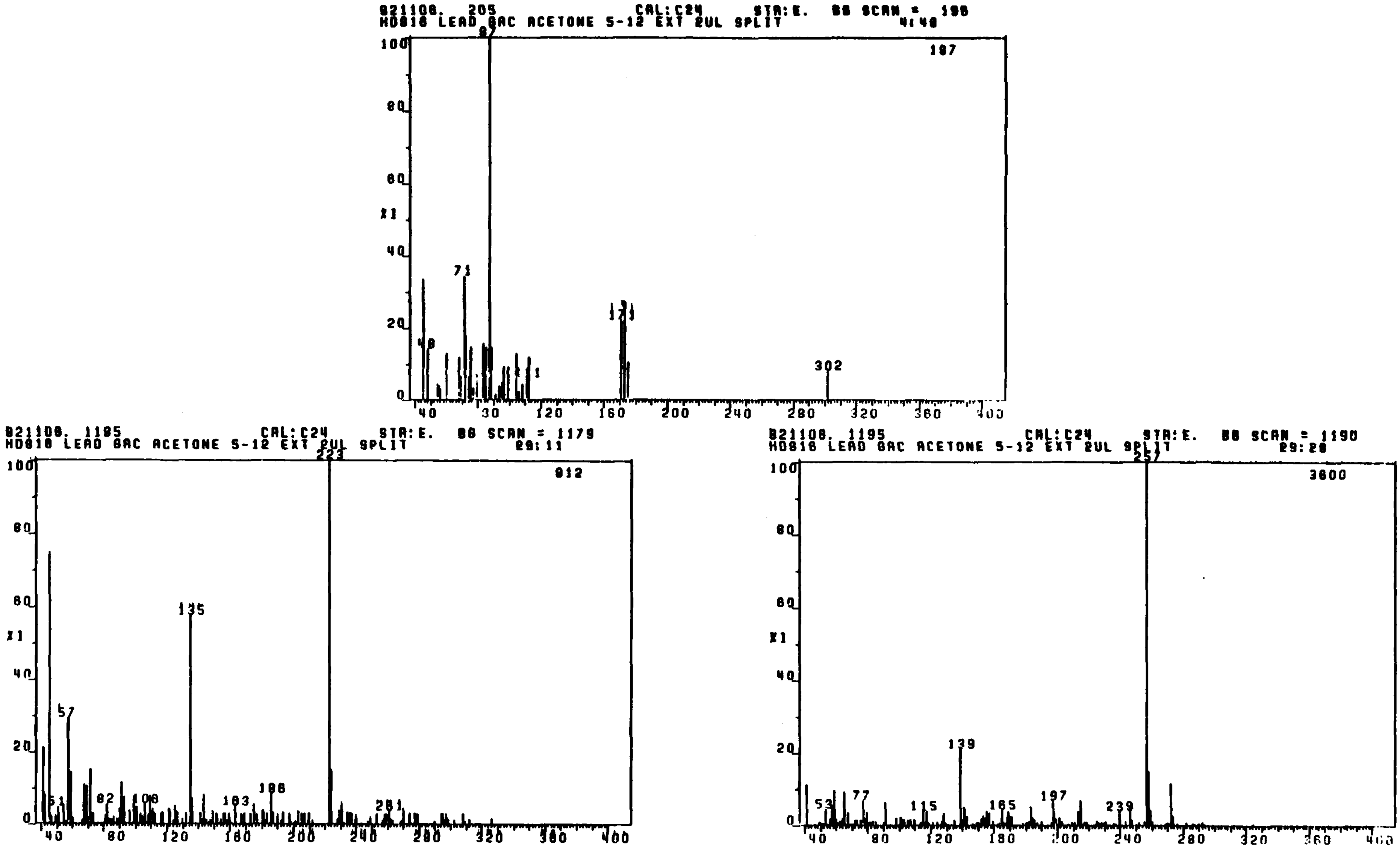
1. "X" indicates that the given SOC was identified in the carbon sample at that location.
2. — = SOC was not identified in the carbon sample at this location.
3. Identification not confirmed.



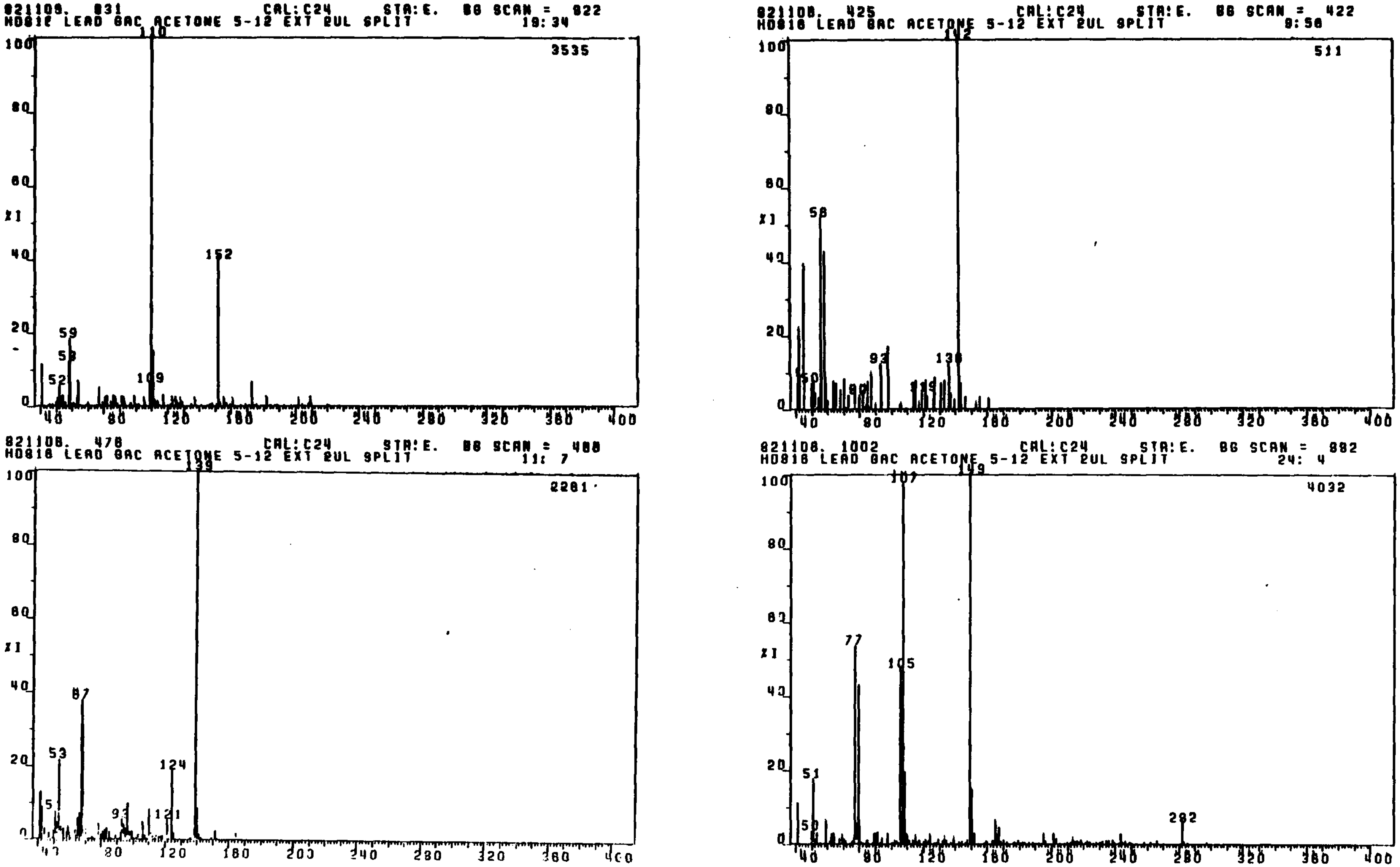
GAC SPECIAL STUDY
MASS SPECTRA OF UNIDENTIFIED COMPOUNDS
FIGURE I. 6-1



GAC SPECIAL STUDY
MASS SPECTRA OF UNIDENTIFIED COMPOUNDS
FIGURE I. 6-1 (Continued)



GAC SPECIAL STUDY
MASS SPECTRA OF UNIDENTIFIED COMPOUNDS
FIGURE I. 6-1



GAC SPECIAL STUDY
MASS SPECTRA OF UNIDENTIFIED COMPOUNDS
FIGURE I. 6-[illegible] (Continued)

SECTION 7

MANGANESE REMOVAL STUDY

BACKGROUND

INTRODUCTION

Manganese can cause serious aesthetic and operational problems in a water supply system. Even at concentrations as low as a few hundredths of a milligram per liter, manganese can cause water discoloration and stain laundry and plumbing fixtures. Within a distribution system, the presence of manganese can stimulate growth of microorganisms which may ultimately lead to reduced pipe carrying capacity and taste and odor problems. Because of this, the U.S. EPA has established a secondary drinking water standard limiting the maximum concentration of this metal to 0.05 mg/L,and the American Water Works Association has suggested a maximum manganese concentration of 0.01 mg/L as an ideal finished water quality goal (AWWA, 1971).

Both sources of EEWTP influent water contained manganese (Mn). The average blended influent concentration for the entire two year operating period was 0.20 mg/L and ranged from less than 0.01 to 1.9 mg/L. A substantial portion of the manganese in the raw water was removed by the processes used in Phase IA, prior to specific manganese control measures. However, a more reliable method of removal was necessary as finished water concentrations during this initial period were often in excess of the secondary standard. A special plant-scale engineering study was undertaken to investigate the manganese problem and to determine the most technically feasible and reliable methods for manganese removal within the EEWTP.

OBJECTIVES

The objectives of the study were as follows:

1. To select an economically and technically feasible method of manganese removal capable of reducing the plant effluent concentration to below the 0.050 mg/L Secondary Maximum Contaminant Level (SMCL) without associated reductions in treatment performance or costly plant modifications.

2 To tudy the fate of manganese through the plant using various processes and operating conditions to determine removal mechanisms and optimum conditions for removal.

3. To tentatively identify the species of manganese in each influent source and in the various stages of treatment.

APPROACH

THEORY

There are a number of treatment methods available for manganese removal. Most involve oxidation of soluble manganese (Mn II) to the insoluble tetravalent form (Mn IV) with capture of the resultant precipitate via sedimentation and filtration mechanisms, or sorption and subsequent oxidation of divalent manganous ions on media coated with oxides of iron and manganese.

In many cases both of these mechanisms work simultaneously. The conditions that favor manganese oxidation prior to sedimentation or filtration usually favor formation of hydrous manganese oxides on media to which the water is exposed. With almost any oxidant, the rate of manganese oxidation increases dramatically with increasing pH (Ficek, 1978). Commonly used oxidants such as chlorine and dissolved oxygen usually require a pH in excess of 8.5 and 9.5, respectively, to be effective within the time constraints of normal operation (Adams, 1960). Unfortunately, operation in this pH range can significantly reduce the effectiveness of TOC removal in the coagulation process when alum is used as the primary coagulant. The use of chlorine early in the treatment process can also lead to the generation of undesirable chlorinated by-products. Stronger oxidants such as ozone, chlorine dioxide and potassium permanganate may oxidize manganese rapidly enough to be effective in the pHs (6 to 7) encountered during alum treatment.

EXPERIMENTAL PLAN

The plan formulated to meet the objective of the manganese study consisted of the following tasks.

1. Review of possible Mn treatment alternatives.

2. Selection and implementation of appropriate alternatives for Phase IA of operation with alum coagulation.

3. Bench-scale testing to determine initial operating conditions.

4. Alteration of process variables (application point, pH) to determine impact on treatment efficiency.

5. Examination of plant data during all three operational phases (IA, IB, IIA) to evaluate the effectiveness of each process used and to assess the impact of process changes.

6. Speciation testing - Filtration of tentative speciation composite samples collected at key plant sites to determine nature and tentative speciation of Mn.

Selection of Alternatives For Phase IA Mn Removal

As described above, most manganese removal processes involve oxidation of soluble manganese with mechanical separation of the resultant particulate, or

sorption onto an oxide coated media such as zeolite, greensand or anthracite with subsequent oxidation of the absorbed, reduced species. Based on a review of the literature and the physical constraints of the plant, it was decided to use an oxidant prior to flocculation and sedimentation in an attempt to form and capture particulate manganese in the sedimentation and filtration processes. The oxidants investigated for use included chlorine dioxide, chlorine and potassium permanganate ($KMnO_4$).

Chlorine dioxide, although a powerful oxidant, was rejected because of the capital cost and problems associated with installing a generating and feed system and because of potential toxicity of the chlorite and chlorate ions which are probable end products of chlorine dioxide treatment (White, 1978). Chlorine has a high oxidation potential and was available at the site, but required a pH greater than 8.0 to be effective in the time available. Application of chlorine to the influent water would have also increased formation of undesirable by-products. For those reasons, chlorine was also rejected. Dissolved oxygen was not considered because the rate of (Mn II) oxidation is too slow at pH of less than 9.0. Potassium permanganate ($KMnO_4$) has a relatively high oxidation potential and oxidizes manganese rapidly over a wide pH range. Because a feed system was inexpensive, simple to install and operate and provided flexibility, $KMnO_4$ was selected as the oxidant for use in Phase IA.

Bench-Scale Testing of $KMnO_4$

Initial testing was performed to determine the $KMnO_4$ demand of the raw water. Tests indicated that the ultimate permanganate demand of the water varied considerably. For a 15 minute permanganate demand test, the demand ranged between 0.5 and 1.5 mg/L. Based on these tests, an initial constant dosage of 1 mg/L was chosen.

Another set of bench-scale tests was conducted to determine the optimum application point for the permanganate. These tests indicated that the application of permanganate as far ahead of the coagulation process as possible improved the removal of the colloidal MnO_2.

SPECIATION

A special testing program was begun in late December, 1981, to tentatively determine the manganese species at five EEWTP sites. Special unacidified, 24 hour composite samples were filtered on-site through a 0.1 µm membrane filter and then shipped to the off-site lab for analysis of Mn content. Although this technique did not quantify speciation exactly, it can be assumed that any Mn which passed through a filter of such small pore diameter was soluble in nature. The sites sampled included both influent sources, sedimentation tank effluent, the gravity filter clearwell and the GAC clearwell.

DISCUSSION OF RESULTS

This section describes the performance of the various process combinations used for manganese control during the entire EEWTP project. The two year period has been broken down into nine discreet operating intervals for

evaluation purposes. Each interval represents a major process or variable change that affected the fate of manganese through the experimental plant.

Manganese in the EEWTP Influent Source

Both EEWTP raw water sources contained significant concentrations of manganese. A time series plot of the manganese in the blended influent is presented in Figure I.7-1. Influent concentration data (Table I.7-1) and speciation data for the raw EEWTP water sources (Table I.7-2) indicate that the nitrified effluent was usually the largest contributor of manganese, especially in the winter months. The speciation data also indicate that during the colder months, the majority of the manganese from the Blue Plains source was unfilterable and therefore probably soluble in nature. This is likely a result of that plant's use of ferric chloride and ferrous sulfate for phosphorus removal in secondary treatment. Liquid ferrous sulfate can contain as much as 400 mg/L of Mn, and test results on ferric chloride samples, performed by the manufacturer, have indicated that the liquid $FeCl_3$ can contain Mn in concentrations from 2,800 to 13,900 mg/L.

The Potomac estuary, on the other hand, showed a seasonal increase in manganese concentration during the summer months, probably as a result of reduced stream flow. Manganese speciation data from the estuary samples also indicated that filterable manganese was predominant during the warmer months, indicating oxidation of the Mn at the warmer temperatures.

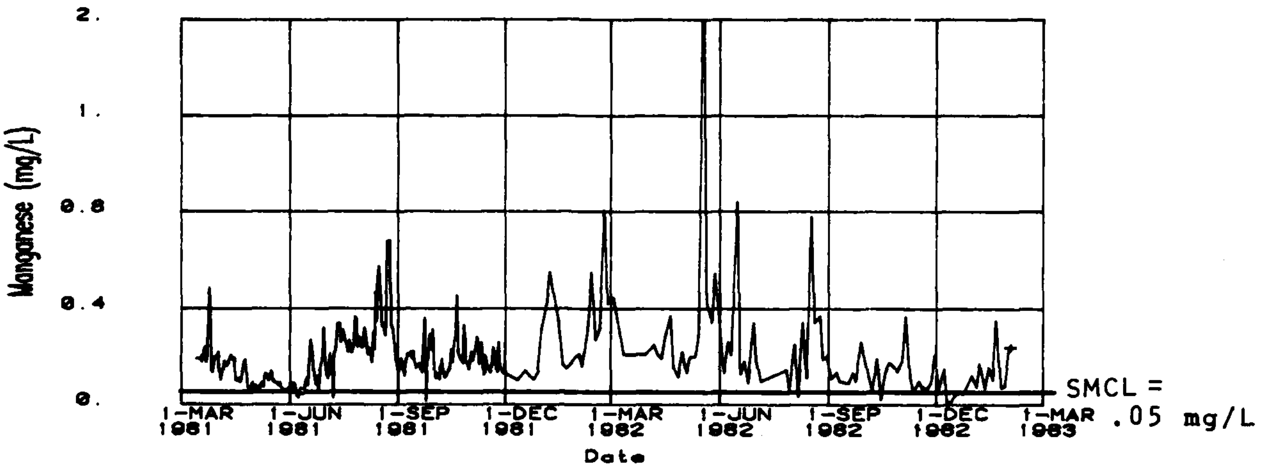
PLANT PERFORMANCE

For evaluation purposes, the two year project was divided into nine operational periods. The first seven periods all occur during Phase IA and represent significant process changes effecting manganese removal. These have been designated as A through G. Period H covers Phase IB when ozone was used prior to gravity filtration, and Period I represents Phase II high lime treatment. Figure I.7-2 shows each of these operating periods against a time series plot of blended influent and finished water manganese concentrations.

The dates, operating conditions and results of each period are presented in Table I.7-3. The results portion of the table provides the number of samples quantified, N; the geometric mean value of the finished water; the percentage of manganese removed through the plant; and the 95 percent confidence interval for the removal percentage for each evaluation period. All samples used for process analysis were 24-hour automatic composite samples. A discussion of each operating period is presented below.

Period A

Period A was the initial period of plant operation in which no deliberate manganese removal strategy was practiced. During this period, influent manganese concentration averaged 0.13 and ranged from 0.051 to 0.45 mg/L. Finished water values averaged 0.082 with a maximum value of 0.359. Although approximately fifty percent Mn removal was achieved, using the geometric mean value as the measure, removal was somewhat erratic and appeared to improve



MANGANESE IN EEWTP BLENDED INFLUENT

FIGURE I. 7-1

TABLE I.7-1

MANGANESE CONCENTRATIONS IN THE EEWTP BLENDED INFLUENT AND INDIVIDUAL RAW WATER SOURCES

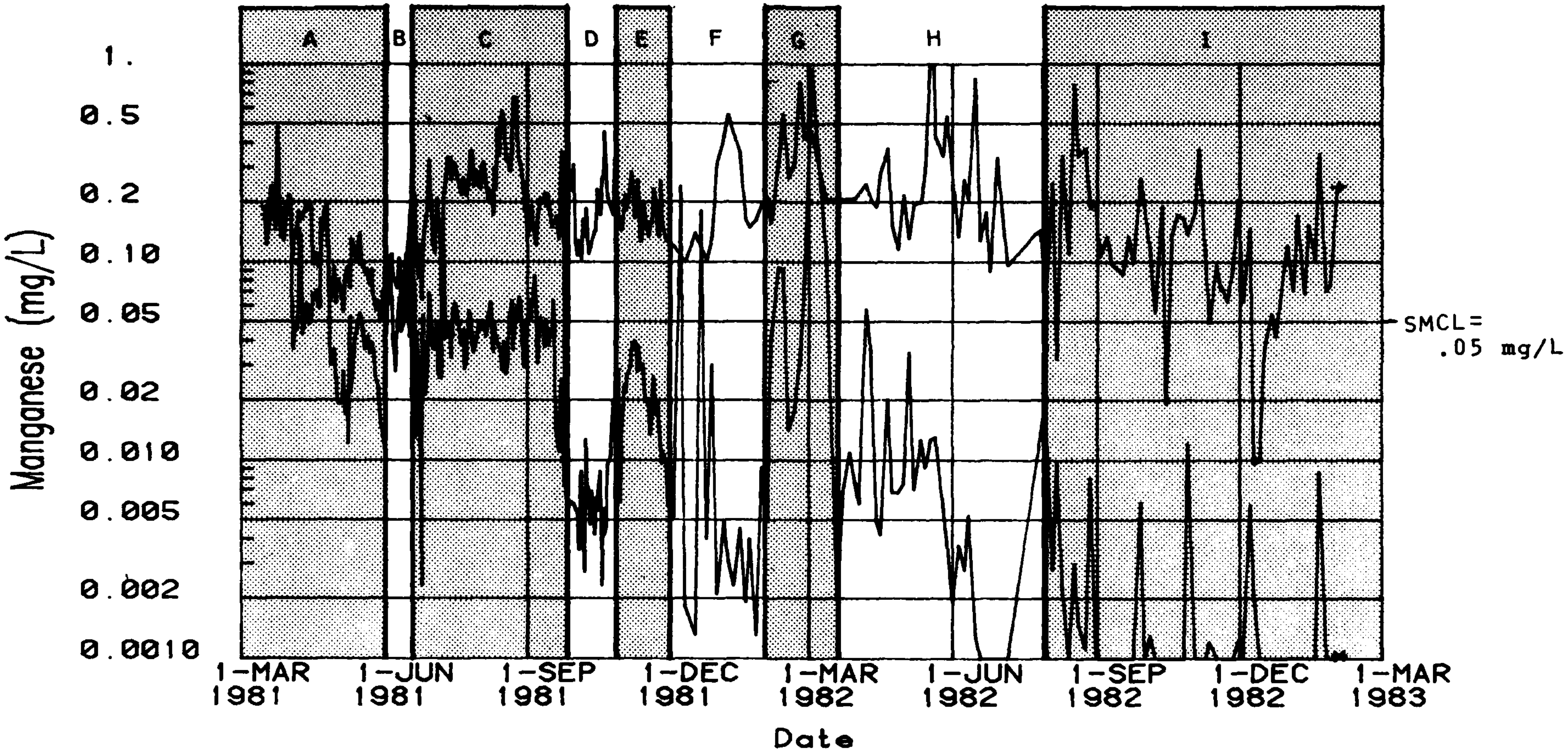
Statistic	Nitrified Effluent	Potomac River Estuary	Blended Influent
No. Samples	106	113	356
No. Above MDL	106	113	356
Arithmetic Mean	0.243	0.143	0.197
Standard Deviation	0.175	0.100	0.155
Geometric Mean	0.185	0.115	0.159
Spread Factor	2.41	1.94	1.96
Median	0.188	0.124	0.170
90th % Less Than	0.458	0.267	0.340

TABLE I.7-2

RESULTS OF MANGANESE SPECIATION TESTING AT FIVE EEWTP SITES

		Nitrified Effluent		Potomac Estuary		Sedimentation Effluent		Gravity Filter Effluent		GAC Effluent	
	Operating Period	Composite Concentration	Percent Insoluble	Composite Concentration	Percent Insoluble	Composite Concentration	Percent Insoluble	Composite Concentration	Percent Insoluble	Composite Concentration	Percent Insoluble
12/29/81	F	0.213	39	0.027	-59	0.221	86	0.003	-733	0.003	-433
1/5/82	F	0.586	64	0.072	24	0.196	88	0.143	80	0.001	-4100
1/15/82	F	NS[1]	NC[2]	0.054	28	0.208	80	0.144	76	0.001	-1600
1/26/82	G	0.292	8	0.032	-178	0.165	-3	0.157	-21	0.001	-3500
2/5/82	G	0.406	42	NS	NC	0.272	49	0.196	29	0.043	16
2/19/82	G	0.479	29	0.085	76	0.232	54	0.087	16	0.013	-23
2/26/82	G	0.357	22	0.105	6	0.178	43	0.077	-52	NS	NC
4/30/82	H	0.179	16	0.124	>90	0.101	41	0.030	-63	0.004	>75
5/30/82	H	NS	NC	0.243	94	0.069	-9	0.002	-650	<0.001	NC
6/25/82	H	0.153	89	0.196	100	NS	NC	0.02	100	<0.001	NC
8/6/82	I	0.240	100	0.23	100	0.023	100	0.013	100	0.003	>67
9/3/82	I	0.127	91	0.145	100	0.007	100	0.0026	100	<0.001	NC
10/5/82	I	0.114	100	0.214	100	0.01	100	0.010	100	<0.001	NC

1. NS = Not Sampled.
2. NC = Not Calculated.



BLENDED INFLUENT AND FINISHED WATER MANGANESE CONCENTRATIONS

16 MARCH 1981 THROUGH 1 FEBRUARY 1983

FIGURE I. 7-2

TABLE I.7-3

SUMMARY OF OPERATIONAL CHANGES AFFECTING MANGANESE REMOVAL

Operating Period		Operating Conditions		Results				
Period	Dates	pH Control	Oxidant	N[1]	Geometric Mean	% Mn Removed[2]	95% Lower	CI Upper
A	3/16 - 5/31/81	None	None	73	0.0585	50.4	38.2	60.3
B	6/1 - 6/15/81	None	$KMnO_4$ @ 1 mg/L Added @ Rapid Mix No. 1	15	0.0577	4.9	-44.8	37.6
C	6/16 - 9/19/81	None	$KMnO_4$ @ 1 mg/L Added @ Aeration Basin	93	0.0432	80.3	77.3	82.9
D	9/20 - 10/30/81	Lime added in Aeration Basin to off-set pH Drop Caused by Lime Addition pH Target=7.0	$KMnO_4$ @ 1 mg/L Added @ Blend Tank	41	0.008	95.7	94.4	96.7
E	11/1 - 12/1/81	Lime Addition Moved to Sedimentation Basin Effl. pH Target=7.0	$KMnO_4$ @ 1 mg/L Added @ Blend Tank	29	0.0207	88.2	85.6	90.4
F	12/2/81 - 1/24/82	Lime Addition In Sed. Basin Effluent pH Target=8.0	$KMnO_4$ @ 1 mg/L Added @ Blend Tank	15	0.0025	98.7	97.1	99.4
G	1/24 - 3/15/82	Lime Addition in Sed. Basin Effluent pH Target=8.0 to 8.5	None	12	0.0323	89.1	68.2	96.3
H	3/16 - 7/7/82 (excludes 4/1-4/13/82)	Lime Addition in Sed. Basin Effluent pH Target=8.0	Ozone @ an Aprox. Applied Dose of 4.0 mg/L	28	0.0038	98.4	97.1	99.1
I	7/16/82 - 2/1/83	High Lime Treatment Coagulation pH 10 5 to 11.5	None	55	0.0004	99.6	99.1	99.9

1. N = Number of Samples Quantified
2. Removal Through Plant

as temperatures increased. This may reflect the fact that incoming manganese was more insoluble in nature during the warmer months and some removal as particulate was achieved. Figure I.7-3(a) presents frequency distributions of manganese in the blended influent, filter effluent and finished water during Period A. The distributions show that most removal occurred in the sedimentation and/or filtration processes and that both the filter effluent and finished water manganese levels exceeded the maximum contaminant level of 0.05 mg/L at the 50th percentile or geometric mean value.

Period B

Period B covers the first fifteen days in June 1981, when permanganate addition at rapid mix tank one was begun. During this period effluent Mn levels were actually higher than influent levels as shown in Figure I.7-3(b). This was probably caused by the formation of colloidal Mn oxides after the coagulation process. The stable colloids may have passed through the sedimentation and filtration process. This would indicate that it is desirable to achieve the formation of manganese oxides well ahead of coagulation to allow the particulate formed to serve as a nucleation site for floc development during coagulation and flocculation, with subsequent removal by settling and/or filtration. This was confirmed by bench testing and plant experience. When the application point was moved to the aeration tank in Period C, twenty minutes ahead of coagulation, the trend reversed and increased removals were achieved.

Period C

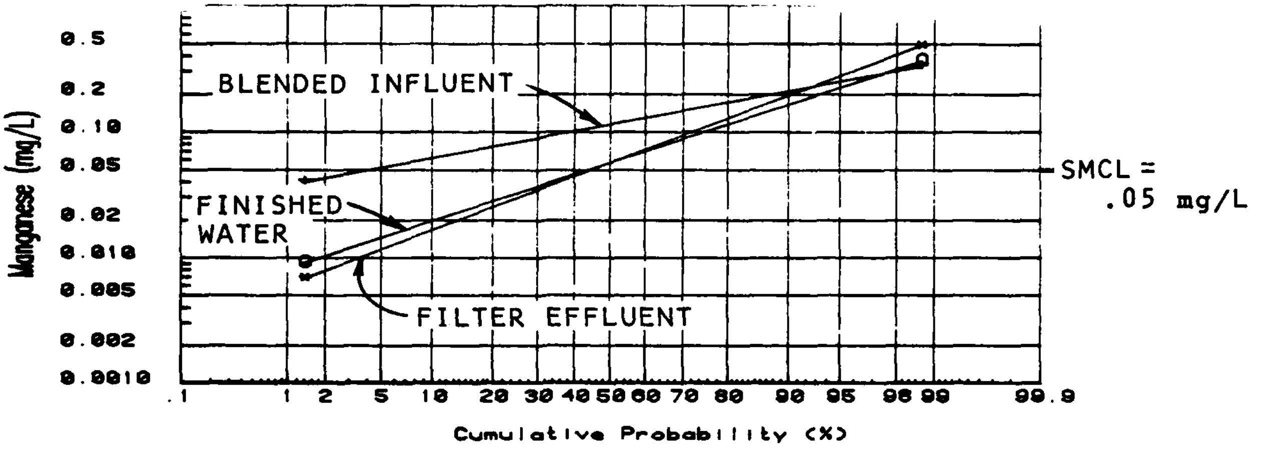
In Period C, with $KMnO_4$ addition at the aeration tank and no pH control, consistently lower finished water Mn concentrations were achieved. The average influent concentration was 0.25 mg/L and the average effluent concentration fluctuated around the SMCL of 0.05 mg/L. On the average, over eighty percent removal was obtained during this period. Figure I.7-3(c) illustrates the increased removal efficiency and reliability obtained with the process change. However, finished water values still exceeded the SMCL in approximately forty percent of the samples.

Period D

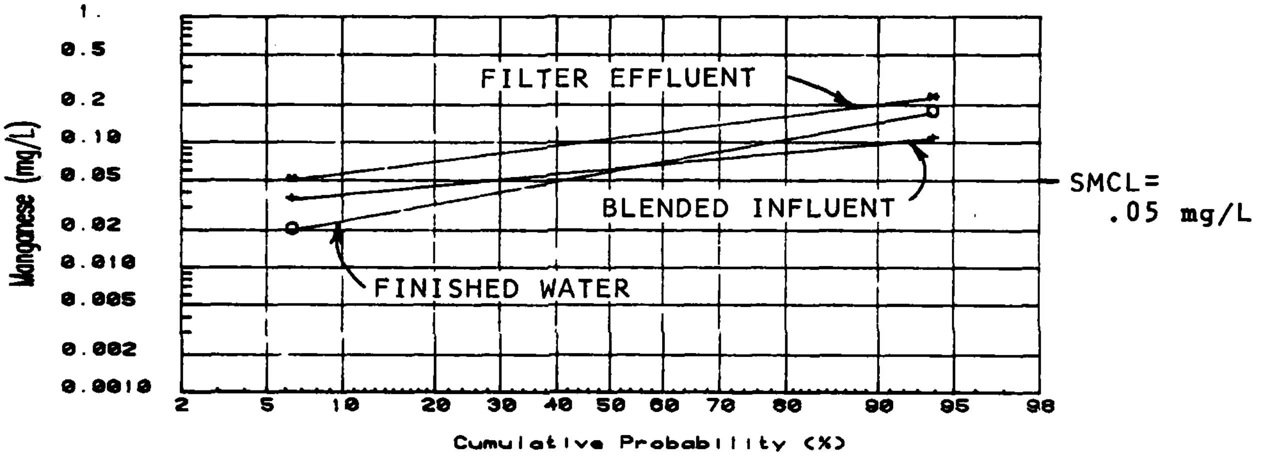
Period D from late September through October 1981, consisted of pH control ahead of coagulation. Lime slurry was dosed at a rate to offset the pH drop caused by alum treatment. $KMnO_4$ was maintained at 1 mg/L and the addition point was moved to the blend tank effluent.

During this period, excellent Mn removals were achieved. Finished water concentrations averaged only 0.009 mg/L and the average removal over this period was in excess of 95 percent. Also significant was the fact that consistent removal was achieved in the GAC process as shown in Figure I.7-3(d). Throughout this operating period filter effluent and finished water manganese concentrations were well below the SMCL.

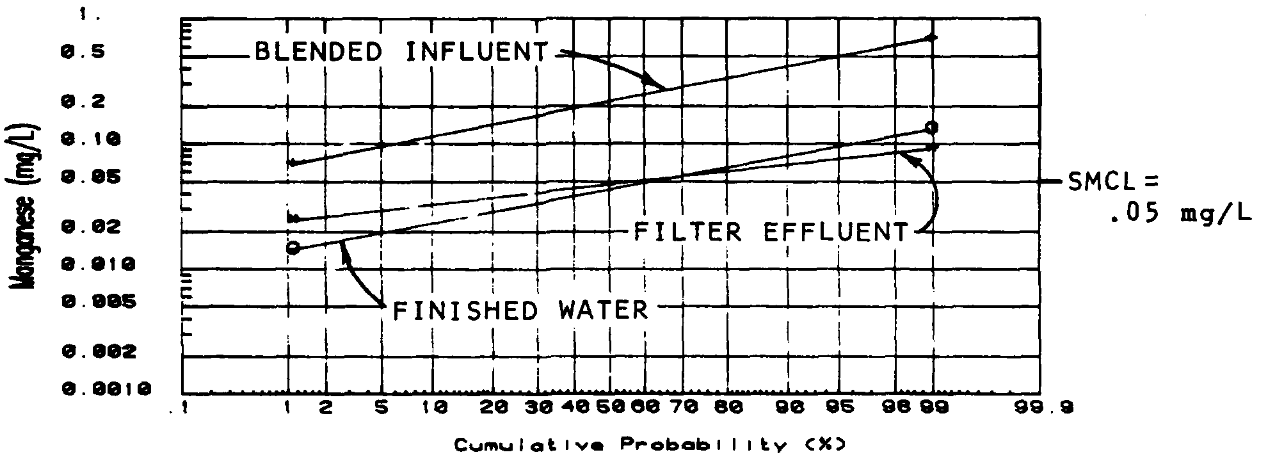
The increased removals experienced during this operating period may be explained by two phenomena. First, the increased pH caused by the addition of lime in the aeration tank, twenty minutes prior to alum addition, accelerated



(a) Operating period A



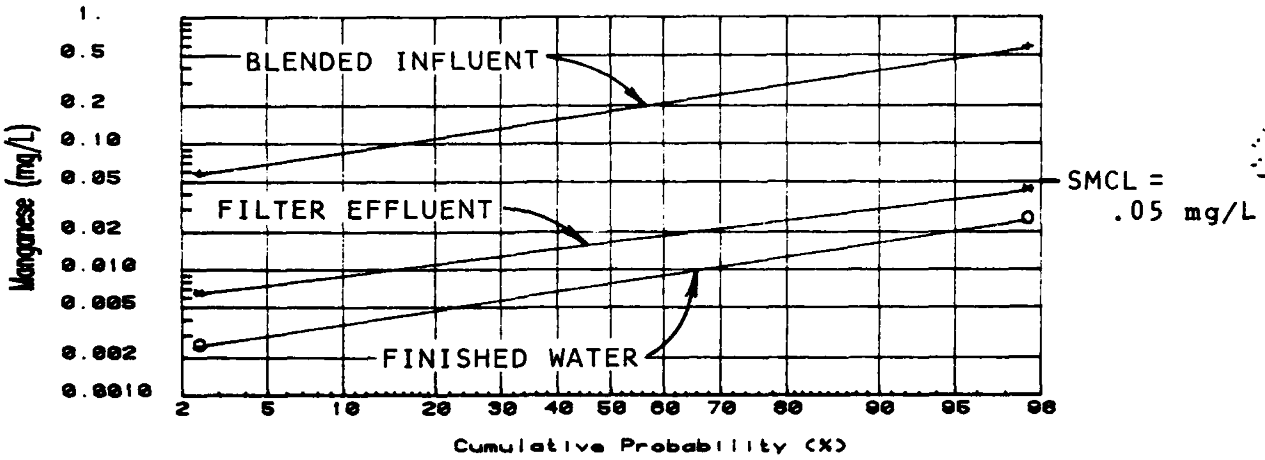
(b) Operating period B



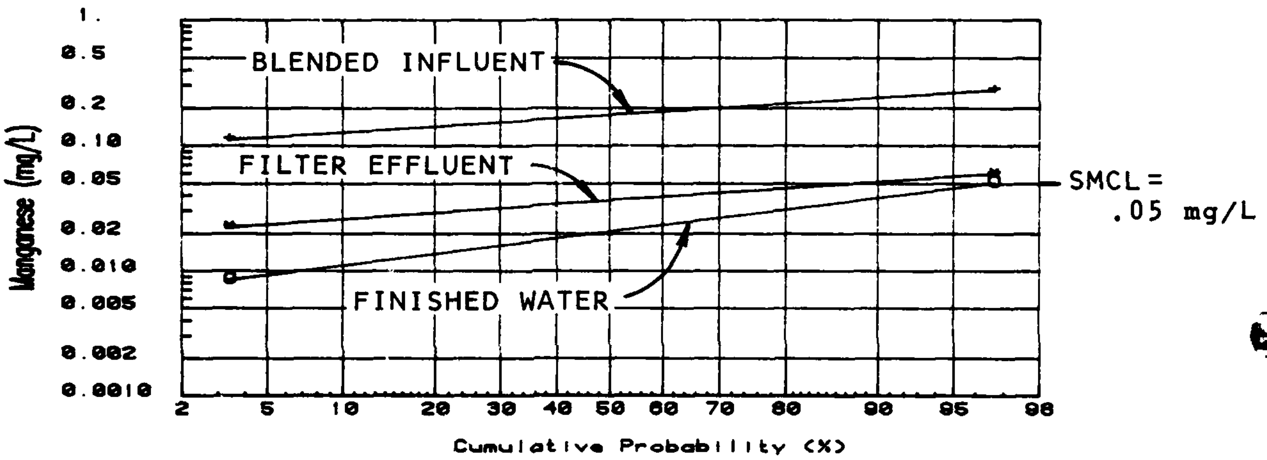
(c) Operating period C

DISTRIBUTION OF MANGANESE AT EEWTP SITES DURING INDICATED OPERATING PERIODS

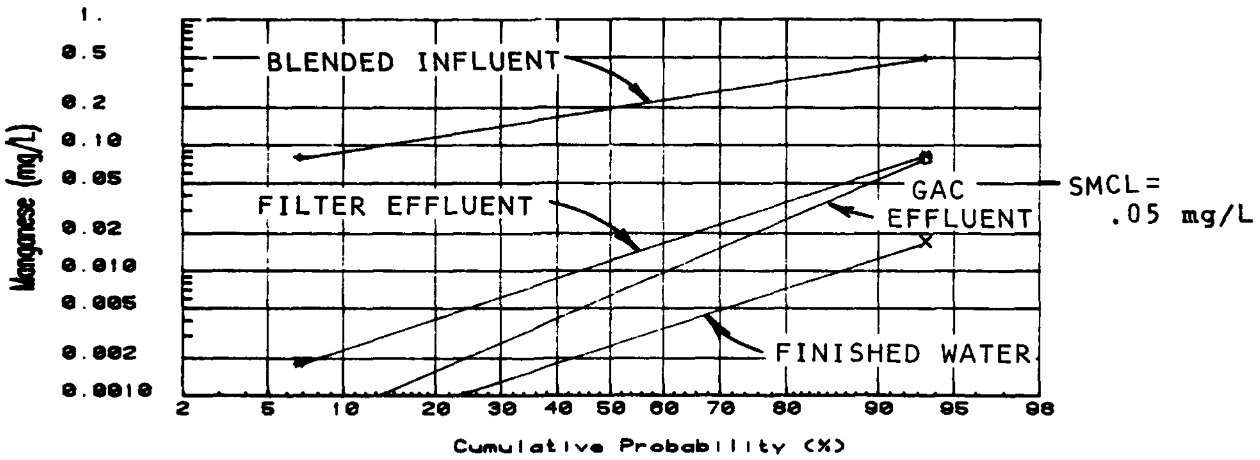
FIGURE I. 7-3



(d) Operating period D

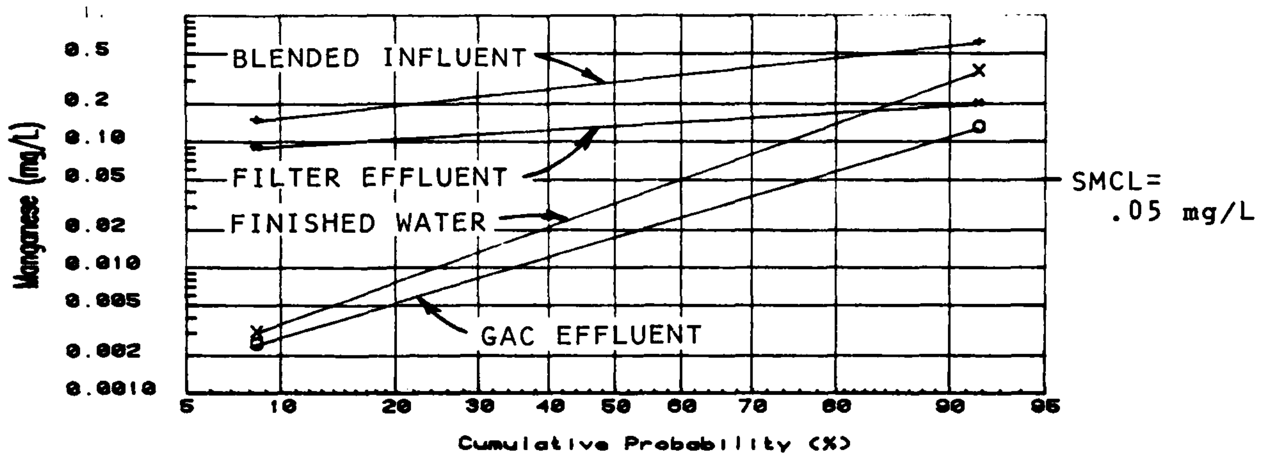


(e) Operating period E

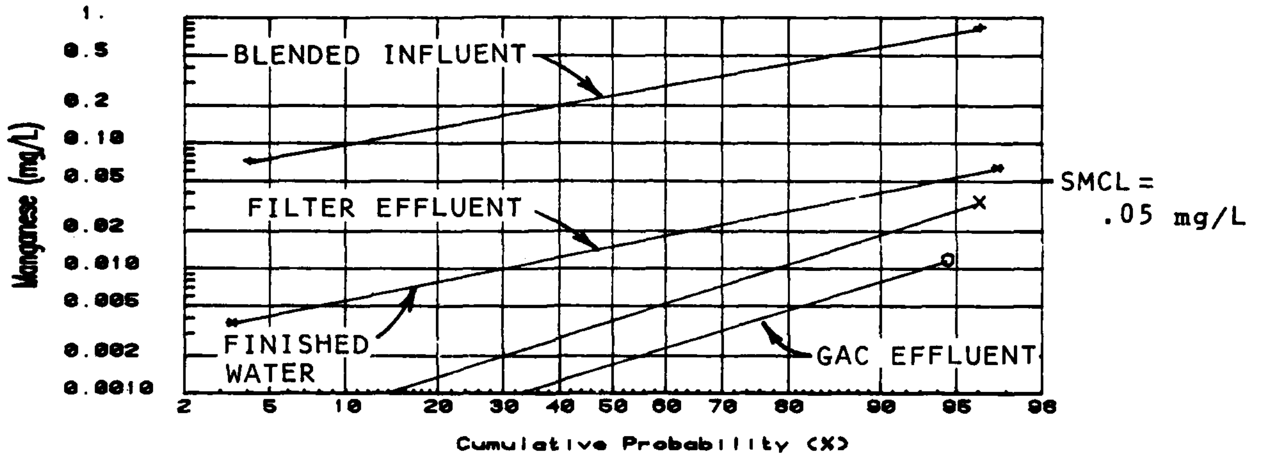


(f) Operating period F

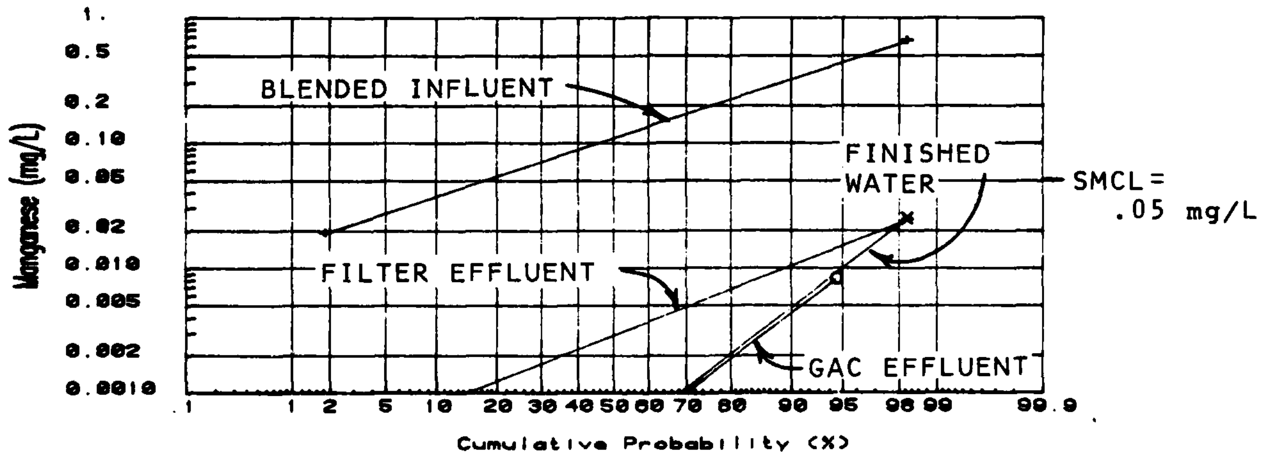
DISTRIBUTION OF MANGANESE AT EEWTP SITES DURING INDICATED OPERATING PERIODS
FIGURE I. 7-3 Cont.



(g) Operating period G



(h) Operating period H



(i) Operating period I

DISTRIBUTION OF MANGANESE AT EEWTP SITES DURING INDICATED OPERATING PERIOD

FIGURE I. 7-3 Cont.

the oxidation of Mn II by permanganate. Secondly, as shown by Posselt (1968) addition of calcium aids in the destabilization of colloidal manganese dioxide and consequently permits enhanced removal in the coagulation process. Unfortunately, it was necessary to terminate the application of lime ahead of the coagulation because TOC removal during alum coagulation was reduced at the higher pH.

Period E

Period E covers the month of November 1981. During this period the $KMnO_4$ addition remained at the blend tank and lime addition for pH control to 7.0 was moved to the sedimentation effluent trough. As discussed above, this was done because TOC removals deteriorated when the pH was increased in the coagulation process. Although finished water values were below the SMCL during this period, a slight deterioration in removal efficiency through filtration was noticed. Manganese removal in the GAC process continued during this period as shown in Figure I.7-3(e).

Period F

Conditions in Period F were similar to E except that the target pH was raised from 7.0 to 8.0. Removals were generally good during this period, especially in the GAC process. This may have been due to the increased pH enhancing oxidation of any remaining soluble (Mn II) in the filter clearwell, resulting in removal of manganese oxides in the GAC bed. The frequency distribution in Figure I.7-3(f) illustrates this. Also included in this figure is a distribution of manganese in the GAC effluent. Sampling at this site began on December 1, 1981.

It is interesting to note that the finished water manganese concentrations were higher than the GAC effluent during this period. The reason for this is unknown. On two occasions finished water manganese levels were higher than influent concentrations. It is believed that these outlying points were caused by Mn oxides sloughing off the clearwell walls or sample piping at the chlorine contact tank.

Speciation testing was also begun during this period. Results from the first three Period F samples are presented in Table I.7-2. The data indicate that a substantial portion of the soluble manganese entering the plant during Period F was oxidized and converted to a filterable state before filtration. The data also indicate that considerable particulate removal was achieved by the GAC process in two of the three samples.

Period G

Permanganate addition, was terminated on 24 January 1982, and this date is taken as the beginning of Period G. Lime addition ahead of filtration was continued to see if removal by adsorption and autocatalysis on filter media or GAC (potentially coated with oxides of manganese) was possible at an elevated pH. Unfortunately, the study was somewhat complicated during this period because of the ammonia problems discussed in Chapter 7. During this period the intermediate chlorination process was used to oxidize ammonia. Various

chlorine to ammonia ratios were used and in the later part of February, free chlorine residual was often present in the filter clearwell as a result of breakpoint chlorination, allowing further oxidation of any reduced manganese in the filter clearwell or GAC process. Wide variation in pH also occurred during this period further complicating analysis of the removal mechanisms.

Despite these problems, several conclusions can be drawn from the data collected during this period. Inspection of speciation data for Period G, in Table I.7-2, reveal that when $KMnO_4$ treatment was stopped, filterable or oxidized manganese concentrations in the sedimentation basin effluent dropped by almost half. This indicates that $KMnO_4$ was effective in oxidizing manganese. The speciation data and Figure I.7-3(g) also indicate that the majority of removal during this period occurred in the GAC process. The GAC on line at the time had been in service for several months and the GAC bed may have contained oxides of manganese which could adsorb Mn II and catalyze subsequent oxidation. As discussed above, use of free intermediate chloride during this period may have also contributed to further Mn II oxidation.

Although substantial manganese removal did occur in Period G, especially in the GAC process, removals were erratic as indicated by the 95 percent confidence interval on removal; see Table I.7-3. The finished water concentrations exceeded the 0.05 mg/L SMCL in forty percent of the samples taken.

Period H

Period H represents Phase IIB, during which ozone was used immediately prior to gravity filtration and pH control of sedimentation effluent was continued. Data from the first twelve days of April is excluded from the statistical summaries because the ozone system was down for repair during this time. The applied ozone dose for Period H averaged approximately 3.5 to 4.0 mg/L. Approximately two-thirds of the applied ozone dose was transferred to the water and utilized. Details concerning intermediate ozonation can be found in Chapter 7 of this report.

Excellent Mn removal was achieved during this operating period. Over 98 percent of the removal occurred during the filtration process. This indicates that ozone was successful at quickly oxidizing most of the soluble manganese at an operational pH of 8.0. This is further illustrated in Figure I.7-3(h) and in the speciation data of Table I.7-2. Some additional removal also occurred in the GAC process.

Period I. As expected, manganese removal was outstanding in the high lime mode of operation. Removals exceeded 99 percent and manganese was only detected in 17 of 55 finished water samples. The speciation data in Table I.7-2 show that almost all removal occurred in the sedimentation process.

CONCLUSIONS

1. Both EEWTP raw water sources contain varying concentrations and species of manganese.

2. With alum coagulation at or near neutral pHs, some form of manganese control is necessary.

3. Oxidation of soluble manganese with capture of resultant particulate in the coagulation and/or filtration is a viable alternative for manganese removal.

4. Potassium permanganate is suitable for use as an oxidant at neutral pH. However, upward adjustment of the pH greatly enhances oxidation and removal. Addition prior to the coagulation process is essential.

5. Ozone is very effective in quickly oxidizing soluble manganese in the pH ranges observed during Phase IIB (7.5 to 8.0).

6. Lime softening or high lime treatment is extremely effective for manganese removal.

RECOMMENDATIONS

Manganese removal is a concern which deserves serious consideration with respect to the design and operation of an estuary water treatment plant. Soluble manganese levels from both the Potomac estuary and Blue Plains nitrified effluent were relatively high during the monitoring of this study, and levels on the order of 0.2 mg/L have been modeled for the estuary under drought conditions (see Chapter 6).

With alum coagulation special control measures will be required. Allowances must be made for some form of preoxidation and pH adjustment. Potassium premanganate is suitable for use as a preoxidant and should be included in design. With respect to manganese removal, intermediate ozonation offers several advantages over intermediate chlorination. $KMnO_4$ facilities may not be required if the ozonation process is utilized.

SECTION 8

THM/TOX FORMATION STUDY

BACKGROUND

INTRODUCTION

When chlorine is used for the disinfection of drinking water, halogenated organics are formed, including trihalomethanes (THMs) as well as other components of purgeable and non-purgeable total organic halides (TOX). Following an assessment of the occurrence frequency, sources and potential health risks of THMs, the EPA promulgated regulations limiting the permissible levels of THMs to 0.10 mg/L THM. The levels are based on established monitoring procedures that call for sampling at "representative" and "extreme" locations in the water distribution system.

The yield of THMs from the reaction of chlorine with organic precursors has been shown to depend on the reaction time, pH, chlorine:TOC ratio, temperature, bromide concentration and the concentration and nature of the organic precursors.

OBJECTIVE

The objective of the THM/TOX study was two-fold:

1. To gain an increased understanding of the kinetics of THM and TOX formation when plant process water is chlorinated. Specifically, the effects, which pH and the chlorine:TOC ratio have upon the rate at which THMs and TOX are formed from organic precursors.

2. To predict the level of THMs which might be formed if the chlorinated plant effluent was subjected to "typical" treatment, storage and distribution conditions. Experimental work was focused on the predicted levels of THM formation potential in the EEWTP chlorinated gravity filter effluent, EEWTP finished water and the local WTP finished waters.

APPROACH

EXPERIMENTAL PLAN

<u>Kinetic Test</u>

Kinetic tests were used to evaluate the effect of pH and chlorine dose on THM and TOX formation in the EEWTP finished water during the alum pretreatment phase of operation. As described in the Methods section below, experimental

conditions were carefully controlled to determine the effects of variations in each independent variable, pH and chlorine, on the rates of formation.

Predictive THMFP

This series of tests were run to predict the THMFP corresponding to plant-scale operating conditions and in the distribution system. Unlike the kinetic tests, the pH and chlorine dose for the predictive tests were not altered, reflecting actual plant conditions at the time of sampling. Temperature, however, was maintained at a constant level of 25°C. The samples were analyzed for TTHM at sixty minutes and one, four and seven days chlorine contact time. At least five finished water samples from the EEWTP (Phase I) and five finished water samples from each of two local WTPs were collected and provided an estimate of the THMFP associated with each water.

A similar set of tests were run with samples from the EEWTP gravity filter effluent and GAC effluent during Phase II, when ozone/chloramines were used for disinfection. For these tests, chlorine was added to simulate chlorination; therefore, predicting the levels of THMs which might be reached if water of this quality were disinfected and entered the distribution system. Sufficient chlorine was added to ensure a free residual of between 2.5 and 3 mg/L-Cl occurred after sixty minutes of contact, similar to EEWTP operational practice. Methods used in the experimental work are described in further detail below.

METHODS

Each series of tests discussed above was conducted according to the standard protocols summarized below. THM samples were analyzed on-site by liquid/liquid extraction with pentane and gas chromotography. TOC, pH, and color were all measured on-site by methods described in Chapter 4. Ammonia was measured on-site using an Orion Model 95-20 Gas Sensing Ammonia Electrode and Model 601A Ionanalyzer.

Kinetic Test

The first set of kinetic tests were performed using the bottle point method. During each test conducted, bottles were tested for terminal THM and TOX at 3, 30, 100, 1,000 and 10,000 minutes. Chlorine dose and pH were adjusted for each series of bottles, as required. The bottles were placed in a water bath to maintain the desired temperature of 25°C and kept under dark conditions.

The kinetic tests conducted with the EEWTP gravity filter and GAC effluents fall into the following two categories.

Test #1. Evaluation of THM/TOX kinetics at the chlorine:TOC mass ratios of 1:1, 2:1, 5:1 and 10:1 while pH and temperature were held constant at 7.5 and 25°C, respectively.

Test #2. Evaluation of THM/TOX kinetics at pH levels of 6.5, 7.5, 8.5 and 10.3; temperature and chlorine:TOC mass ratio were held constant at 25°C and 5:1, respectively.

Predictive THMFP

For the predictive THMFP tests, reactions were carried out in 500 ml amber glass bottles with teflon-lined septa. The collected sample water was split into three separate bottles for analysis at the specified reaction times of one, four, and seven days. Alliquots of the initial sample water were taken for a time zero analysis of THM and TOC. At the specified reaction times, a sample was carefully poured from the reaction bottle into a 60 ml amber bottle where it was quenched and capped for subsequent THM analysis. The remaining sample was analyzed for pH and free and total chlorine residual. All samples were maintained at 25°C in a circulating water bath. For the grab samples of plant finished water, chlorine dose and pH were not altered from the existing finished water conditions at the time of sample collection.

Grab samples of gravity and GAC filter effluent were treated as described above, except that each reaction bottle was dosed with chlorine by the addition of a measured amount of sodium hypochlorite solution. Chlorine doses used, were determined by conducting batch chlorine demand tests. Selection of doses was based on the ability to maintain a 2.5 to 3.0 mg/L free chlorine residual after sixty minutes of contact time. A free chlorine residual of 2.5 to 3.0 mg/L is a desirable range to ensure the gravity and GAC filter effluents were disinfected for distribution.

DISCUSSION OF RESULTS

RESULTS

Kinetic Tests

The results for TTHM and TOX from the kinetic tests are shown in Figures I.8-1 and I.8-2. TTHM concentration of the test water was affected by pH as suggested by the increase in TTHM with increasing pH. TOX production appears to be maximum at pH = 7.5. However, since there are only two data to support this trend, additional testing should be conducted to verify the results. The relatively low concentrations of TTHM and TOX (150 and 300 µg/L, respectively) at 10,000 minutes of contact time were attributed to the low concentration of TOC (1.9 mg/L-C) in the water.

The results of different doses of chlorine in TOX and TTHM formation are given in Figure I.8-2. The tests showed an increase in TOX and TTHM with increase in chlorine dose, as expected. The potential for TTHM formation with different water quality and under conditions of disinfection were evaluated through predictive tests, as described below.

Predictive THMFP Test

Evaluation of EEWTP Finished Waters. The results of the predictive THMFP test for WTP1, WTP2 and EEWTP Phase I are presented in Figures I.8-3(a), (b) and (c), respectively. The error bars in these and other figures in this section represent one standard deviation above and below the arithmetic mean THMFP.

As the results in these figures suggest, the levels of terminal THMs are lower in the EEWTP than either of the two local WTP waters tested.

During Phase II operation at the EEWTP, disinfection was accomplished with ozone followed by chloramines. Under these circumstance, one would not expect any significant increase in terminal THM concentration. A predictive test was run on this water and the TTHM levels measured were less than 5 µg/L and did not increase. TTHMs were not of concern with this treatment process.

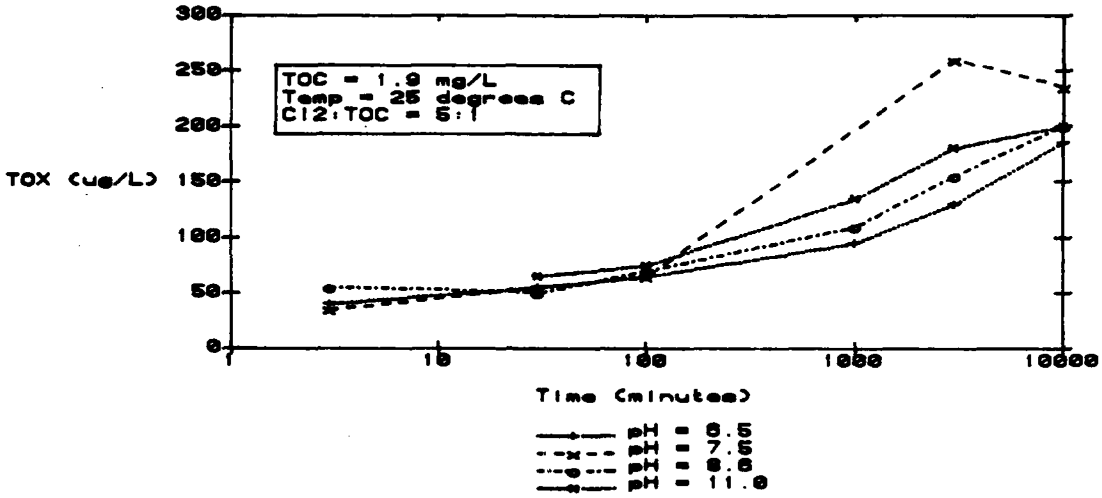
Evaluation of Alternative Process Trains. Two alternate process trains were tested for THMFP. In the first process train tested, gravity filter effluent was chlorinated in order to simulate EEWTP finished water without GAC treatment. The results for Phases I and II are presented in Figures I.8-4(a) and (b), respectively. The results indicate that EEWTP filter effluent without GAC treatment yielded approximately the same terminal TTHM concentrations as measured in the two local WTPs. It is also interesting to note that the different treatment modes had no significant impact on the THMFP of the gravity filter effluent.

The second alternate train examined was replacing the ozone/chloramine disinfection process with free chlorination. The Phase II GAC effluent was tested on three different days, in triplicate. The results from the triplicate bottles showed little variability between bottles for the same test. The results, shown in Figure I.8-4(c), indicate low terminal THM concentrations (below 40 µg/L). It should be noted that the GAC adsorber was only twenty to thirty percent exhausted with respect to TOC at the time the tests were performed.

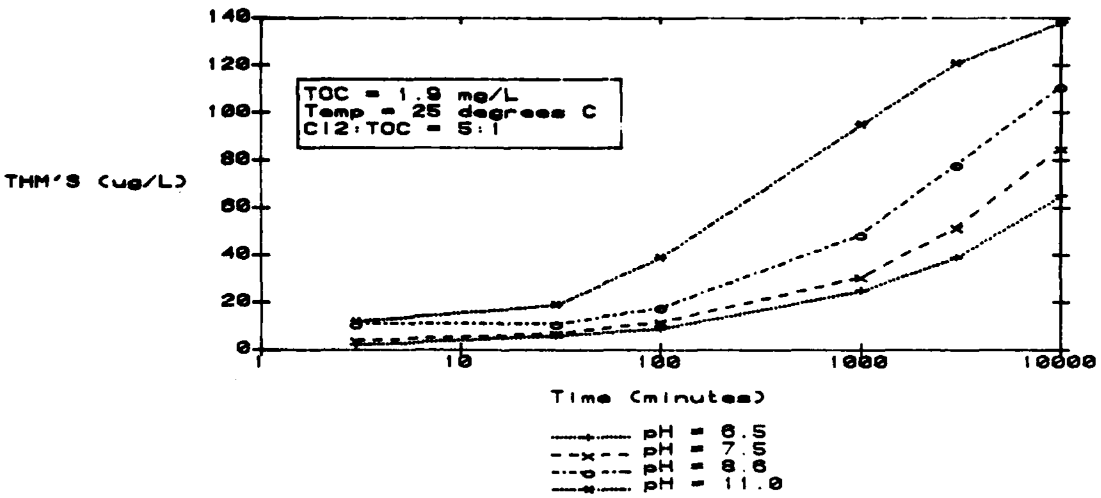
Summary. The TTHM data shown in Figures I.8-3 and I.8-4 are summarized in Table I.8-1, along with the pH and TOC data. The average pH of the test ranged between 7.2 and 7.7, a difference of only 0.5 pH units.

The average TTHMs, measured at 1, 4 and 7 days, of the EEWTP Phase I and II waters were lower than those in WTP1 and WTP3 finished waters. The gravity filter effluent of Phases I and II produced almost the same amount of TTHMs, averaging less than the MCL of 100 µg/L THM. This would suggest that the GAC treatment would not be necessary to meet the federal standards for THMs. However, this does not rule out the need for GAC for a barrier for other synthetic organic chemicals.

The Phase I and II finished waters produced less TTHMs than the gravity filter effluents, as expected. The 7 day TTHM values, 78.5 and 24.9 µg/L THM for Phases I and II, respectively, were influenced by the TOC concentration (a function of the age of the carbon) and type of GAC. The average TOC concentrations were 1.58 and 1.15 mg/L-C, respectively. As stated previously, the carbon was only 20 to 30 percent exhausted with respect to TOC at the time the tests were performed during Phase II, while Phase I carbon was 25 to 75 percent exhausted. Hence the Phase II average TTHM and TOC were much lower than Phase I.

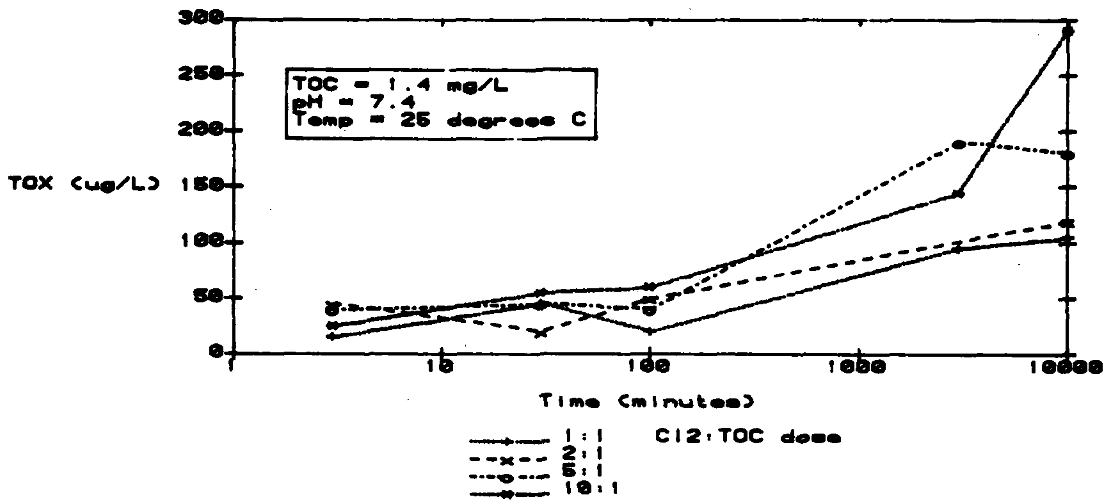


(a) TOX formation over time as a function of pH

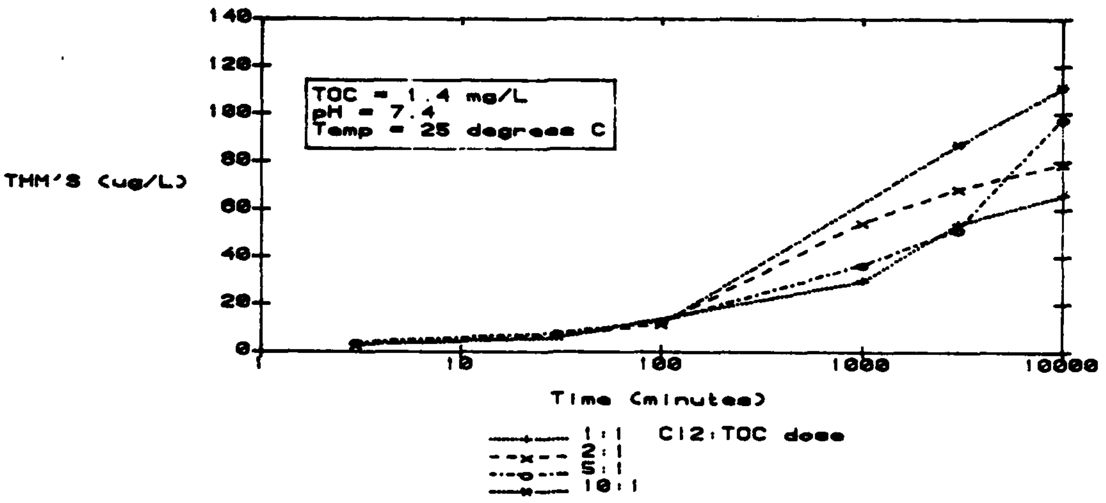


(b) THM formation over time as a function of pH

KINETIC RESULTS FOR VARIOUS pH LEVELS
BOTTLE POINT METHOD
FIGURE I. 8-1

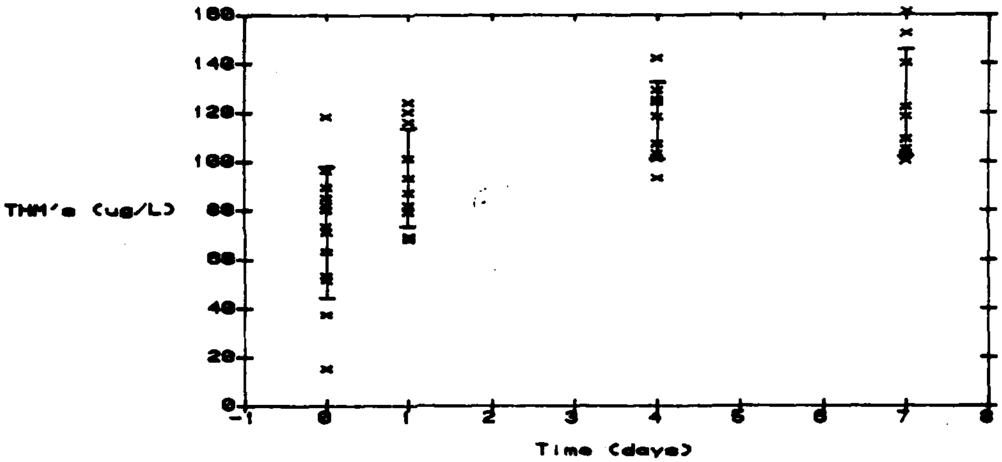


(a) TOX formation over time as a function of chlorine dose.

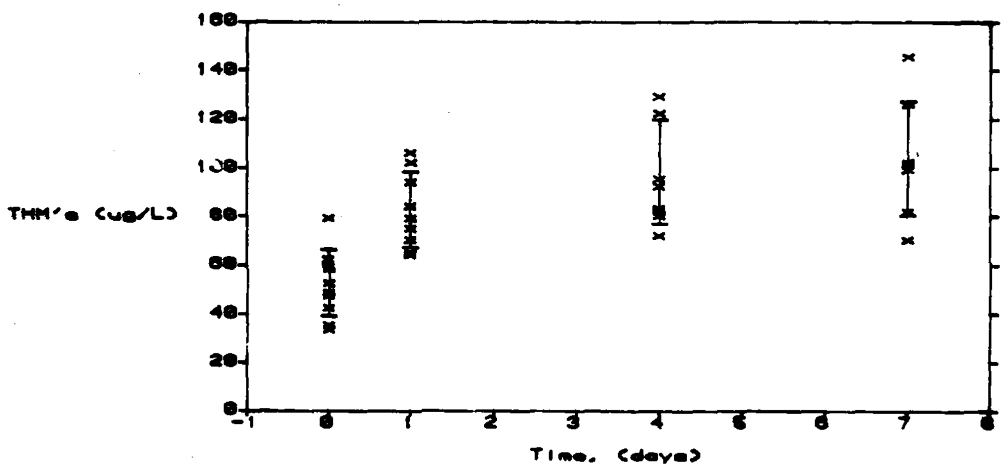


(b) THM formation over time as a function of chlorine dose.

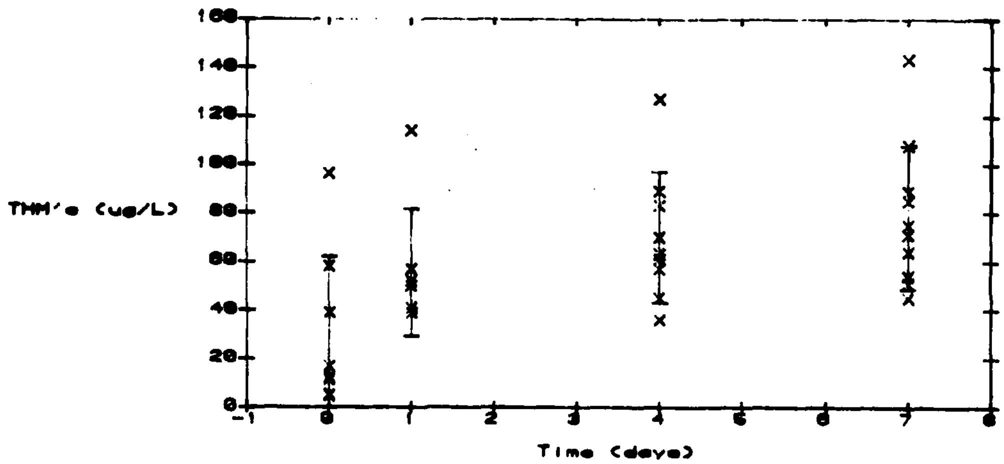
KINETIC RESULTS FOR VARIOUS CHLORINE DOSES
BOTTLE POINT METHOD
FIGURE I. 8-2



(a) WTP 1



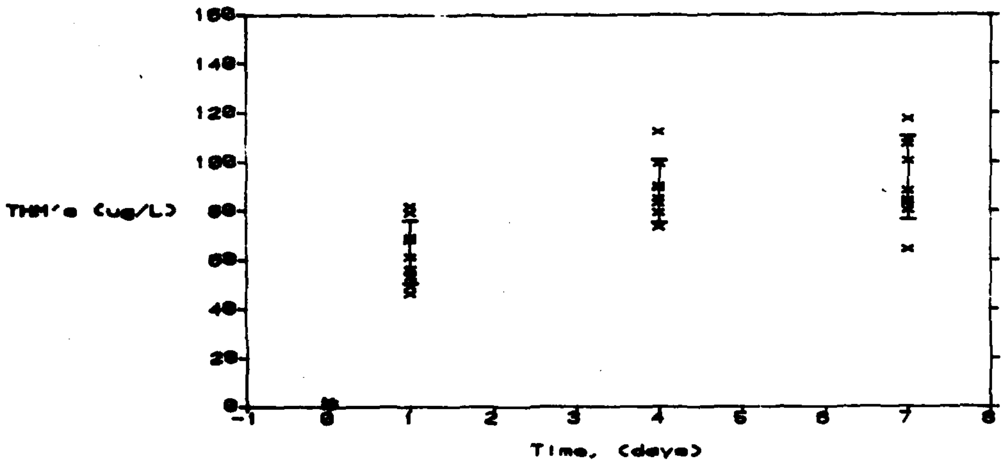
(b) WTP 3



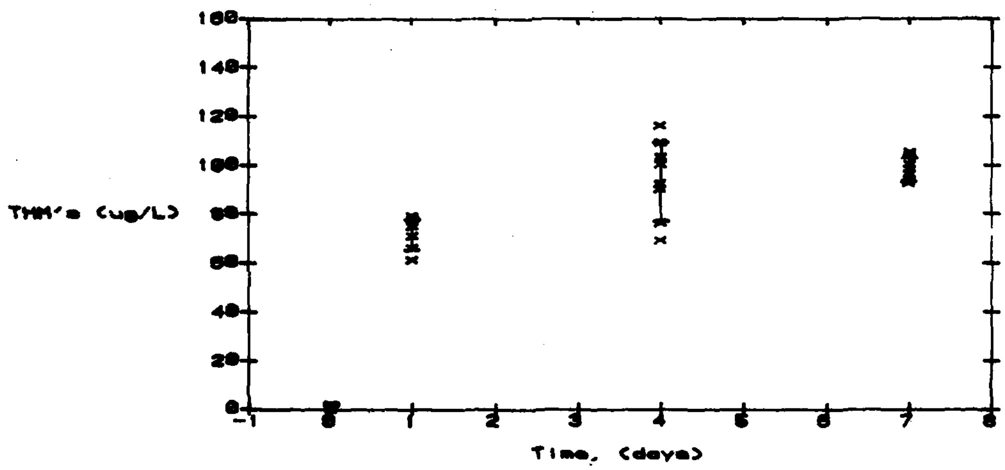
(c) EEWTP Finished Water (Phase I)

PREDICTIVE THMFP RESULTS FOR WTP1, WTP3, AND EEWTP SITES

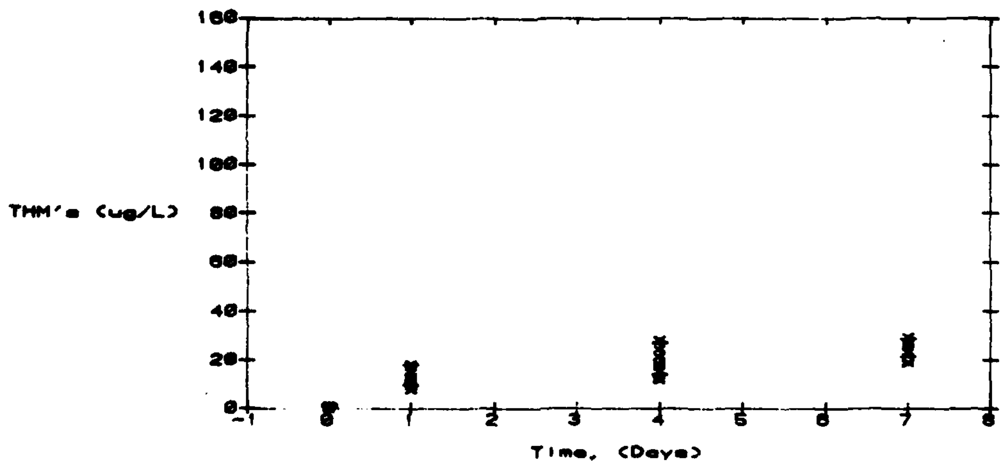
FIGURE I. 8-3



(a) Gravity filter effluent (Phase I)



(b) Gravity filter effluent (Phase II)



(c) Gac effluent (Phase II)

PREDICTIVE THMFP RESULTS FOR GRAVITY FILTER AND GAC EFFLUENTS

FIGURE I. 8-4

TTHM yields, expressed as µg/L TTHM/mg/L TOC, are also shown in Table I.8-1. These yields ranged from 18.2 to 43.8 µg/mg for the four-day yield of TTHM from TOC. It is interesting to note that the TTHM yield of the EEWTP Phase I finished water is greater than the yields calculated for WTP1 and WTP3, as shown in the table. However, chlorinated GAC effluent from Phase II is much lower than the other finished waters. If the set of unusually high outliers is eliminated from the Phase I data (see Figure I.8-3(c)), the resulting yield falls between those for WTP1 and WTP3.

A comparison of average TTHM yields between gravity filter effluent and GAC effluent (or finished water) is made to show the impact of GAC on THM prescursors. The calculations given in Table I.8-1 suggest that THM precursors are preferentially removed during Phase II operation, while the opposite holds true for Phase I operation. Elimination of the set of outliers brings the yields closer together, although the Phase I finished water yield is still higher.

RECOMMENDATIONS

Based on the results of the THM/TOX formation studies, the EEWTP finished water compared favorably to local water supplies with respect to potential 1, 4, and 7 day formations of halogenated organic compounds. Moreover, results suggest that the chlorination of gravity filtered water from either phase would also compare favorably, assuming that such chlorination were controlled to maintain no more than 2 to 3 mg/L free chlorine after sixty minutes of contact.

These results suggest that, with respect to meeting federal requirements for TTHMs, the GAC process would not be required. If GAC is to be utilized as a barrier for other synthetic organic compounds, then regeneration should be based on criteria other than the federal MCL for TTHMs.

With respect to plant operating conditions for disinfection, the THM/TOX kinetic tests suggest that pH is important in the level of formation of THM and TOX. While THM formation was shown to be minimum at lower pH levels above or below 7.5. Additional testing is recommended to verify the TOX results. The results from the THM/TOX testing would be used in conjunction with the results of corrosion testing (see Appendix I, Section 9) to establish target pH levels for the finished water.

TABLE I.8-1

SUMMARY OF PREDICTIVE THM TESTS

Sample	Chlorination Conditions	No. of Samples	Avg. pH	Avg. TOC	Avg. Terminal THM (μg/L) 1-Day	4-Day	7-Day	Avg. TTHM/TOC (μg/mg) 1-Day	4-Day	7-Day
PHASE I										
Gravity Filter Effluent	2-3 mg/L Free Cl_2 after 60 min.	10	7.25	2.87	63.6	88.0	93.4	21.5	31.2	30.5
Finished Water	As chlorinated at EEWTP 2.5 mg/L Free Cl_2 after 60 min.	10	7.71	1.58	56.0	70.1	78.5	36.8	43.8	53.7
PHASE II										
Gravity Filter Effluent	2-3 mg/L Free Cl_2 after 60 min.	3 (in triplicate)	7.65	3.12	71.8	93.3	98.2	23.0	29.6	31.6
GAC Effluent	2-3 mg/L Free Cl_2 after 60 min.	3 (in triplicate)	7.54	1.15	13.8	20.3	24.9	12.2	18.2	22.4
WTP1	As chlorinated at WTP1	13	7.55	2.67	93.6	116.8	124.5	35.0	42.6	47.0
WTP3	As chlorinated at WTP3	10	7.54	2.98	83.1	98.4	104.0	27.7	34.9	37.3

SECTION 9

CORROSION TESTING

BACKGROUND

INTRODUCTION

In response to the Safe Drinking Water Act of 1974, the Environmental Protection Agency established the National Interim Primary Drinking Water Regulations (NIPDWR) which in part establish maximum contaminant levels for certain inorganic chemicals, including lead and cadmium. The NIPDWR further require that the maximum contaminant levels be met at the consumer tap; this is a significant departure from previous regulations which had dealt only with water quality in the utility distribution system.

Water purveyors have traditionally accepted the responsibility for water purity in the utility-owned and maintained pipelines and reservoirs. The adoption of the NIPDWR changed that policy and hold the purveyor liable for the quality of water to the "free-flowing" tap of the consumer.

A water that exhibits corrosiveness can produce problems in the pipelines of a distribution system and home plumbing systems. These problems can be grouped into the categories of health, aesthetics and economics, as discussed below.

First, corrosion of materials in plumbing and distribution systems increases the concentrations of metal compounds in the water. Lead, cadmium, and other heavy metals are present in various amounts in pipe material, and there is concern for the possible health hazards created by corrosion and subsequent dissolution and ingestion of these elements.

Next, secondary contaminants (copper, iron, and zinc) are also leached from plumbing and distribution systems. These contaminants, when present in concentrations above the suggested limits, can render the water aesthetically undesirable for consumption because of taste, color, or staining characteristics.

Last, deterioration of plumbing and distribution systems because of corrosion frequently results in extensive and costly replacement. Corrosion of copper pipe is usually characterized by a uniform etching or thinning of the pipe wall. Failure occurs only when corrosion has damaged the structural integrity of the pipe so much that leakage becomes a problem. Corrosion of galvanized steel and black iron is normally characterized by pits that develop in the pipe surface. These pits may eventually penetrate the pipe wall and cause leakage. As the pipe deteriorates, tubercles build up over the developing pits and tend to form a blockage in the pipe which can eventually restrict water flow so much that the pipe must be replaced. Corrosion within pipelines can thus require

pumping and pipeline replacements and lead to higher costs for a purveyor and, ultimately, the for consumers.

OBJECTIVE

The objective of the corrosion study was to assess available techniques for determining and evaluating corrosivity and to apply a selected testing technique to the EEWTP finished water during Phases I and II. The ultimate objective of the test was to provide an accurate evaluation of the relative corrosivity of EEWTP finished waters.

APPROACH

THEORY

Corrosion or dissolution of metals in water is primarily an electrochemical reaction. When a chemical reaction takes place at one point on the metal's surface, an electrical potential is created between this point and other points on the surface. The potential which exists between the two portions develops into a corrosion cell. The initial development of a corrosion cell is defined by the "rule of heterogeneity".

> RULE OF HETEROGENEITY: If any portion of a metal in aqueous solution is in any way heterogeneous (different) from any other portion, an electrical potential exists between the two portions and a corrosion cell will develop.

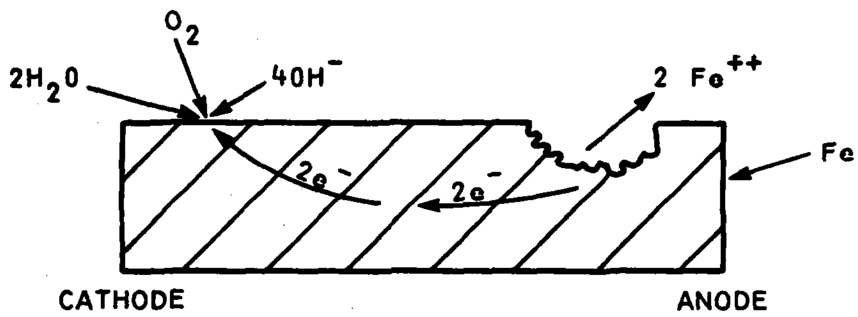
An example of the development of the corrosion cell for iron is described by the following reaction and represented in Figure I.9-1.

$$2\,Fe + 2H_2O + O_2 \rightarrow 2\,Fe^{++} + 4OH^-$$

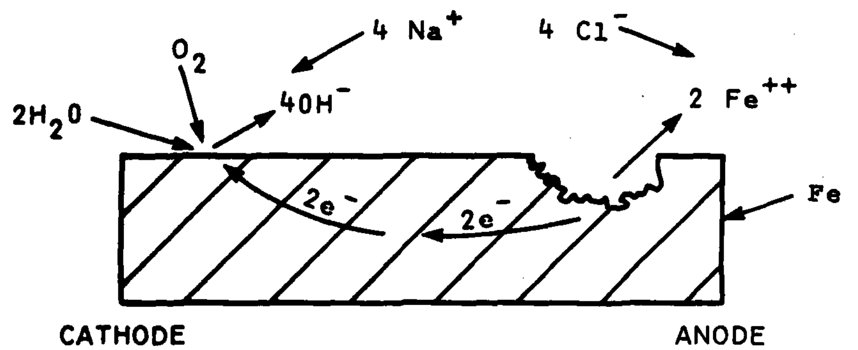
The reaction is described as electrochemical because the metal and the solution must carry an electrical current for the reaction to take place and iron is oxidized. If iron was not a conductor, the electrons resulting from its dissolution would remain at the original site and the rate of reaction would be reduced. In fact, the corrosion reaction would soon stop because of the accumulation of anions at the cathode and cations at the anode. The reaction continues, however, because the solution is also a conductor enabling positive ions to migrate to the cathode while negative ions migrate to the anode. As illustrated in Figure I.9-2, the cation Na^+ and the anion Cl^- have migrated to the cathode and anode, respectively, to balance the ions produced in the corrosion reaction.

The corrosivity of water (the ability of the solution ions to react with the metal ions), is evaluated in terms of weight loss over time and can be expressed as either a rate or a depth of penetration. These parameters are expressed in the units shown below

rate : grams per square meter per day (g/m^2d)
penetration : millimeters per year (mmpy)



CORROSION CELL FOR IRON
FIGURE I. 9-1



CORROSION REACTION - ONGOING
FIGURE I. 9-2

Corrosion Testing

Four methods are used to evaluate the corrosivity of water as listed below.

Method	System Measured
Wire Coil Test	Steam Condensate
Coupon Test	Cooling Water
ISWS Machined Nipple Test	Cooling and Distribution Water
USBM Machined Nipple Test	Steam Condensate

The coupon and ISWS machined nipple test are both used in the water industry. In the coupon test, coupon sized metal inserts are hung in an apparatus through which the water of interest flows. For the ISWS test, pipe inserts, approximately four inches in length, of each metal of interest are placed on-line in a sidestream apparatus through which water flows. The ISWS test reflects a more realistic approach for testing the corrosion potential in the distribution system; therefore, this technique was selected for use at the EEWTP.

Results from corrosion experiments of this type provide rates of corrosion for each metal and are indicative of the relative corrosivity of the finished water. Corrosion indices, calculated from water quality data, can also be used to help characterize the finished water. These corrosion indices help define the "corrosion potential" of the finished water and can be used to compare the finished water quality of different plants. Three corrosion indices have been determined for the EEWTP finished water: buffer intensity, Langelier index, and Larson's ratio. All three parameters are discussed below.

Buffer Intensity

Buffer intensity indicates the capability of the bulk solution to resist changes in pH. The total alkalinity of the solution is a measure of its buffer capacity and the slope of the alkalinity titration curve is a description of its buffer intensity. Thus, the buffer intensity (B) is a function of pH and total alkalinity and is defined as follows:

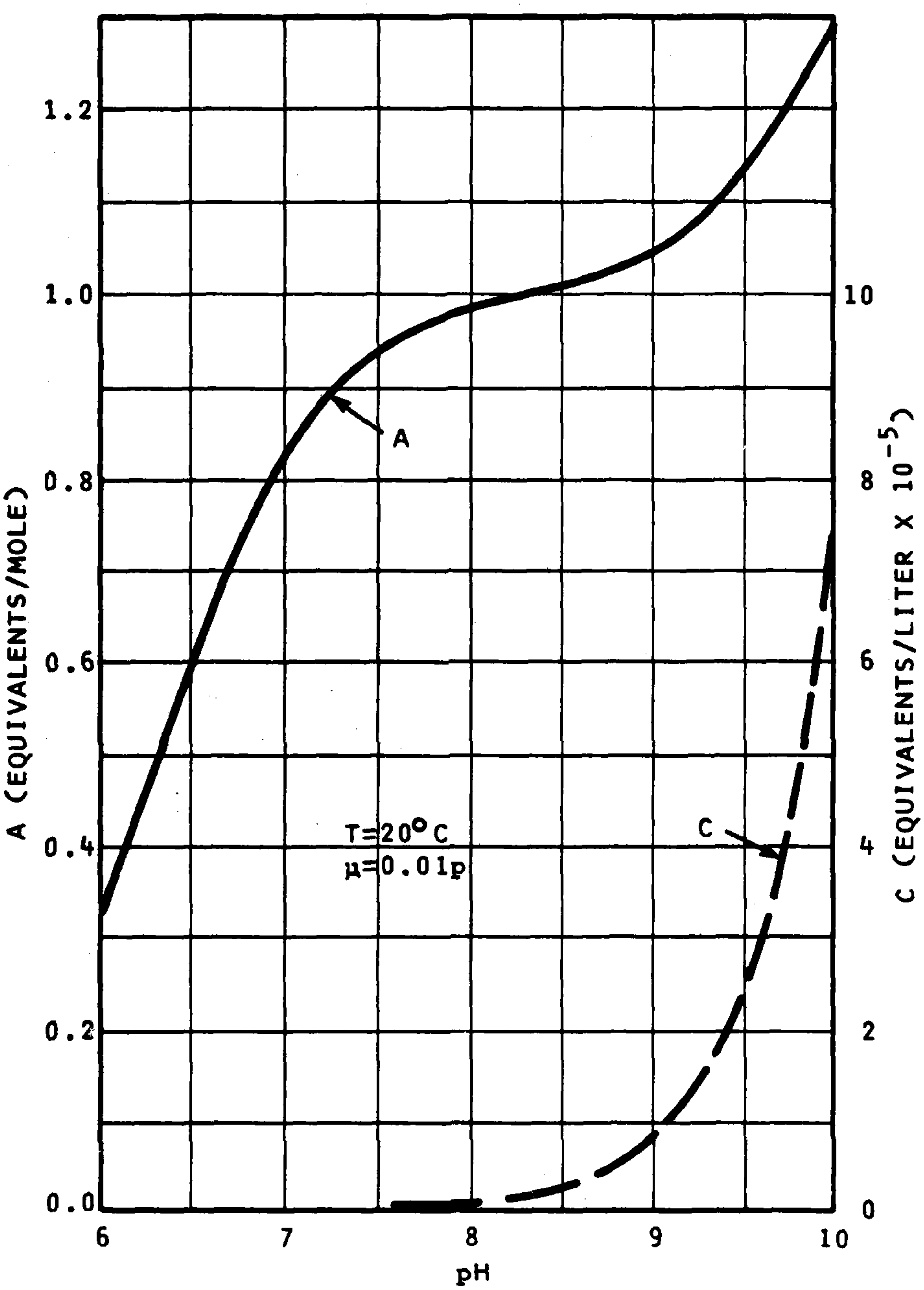
$$B = d\ Alk/dpH$$

A value of $B<0.5$ implies the water is potentially corrosive; a value >0.5 implies a non-corrosive water. Corrosivity is a complex phenomenon, however, and it cannot be assumed that a high buffer intensity insures low corrosivity.

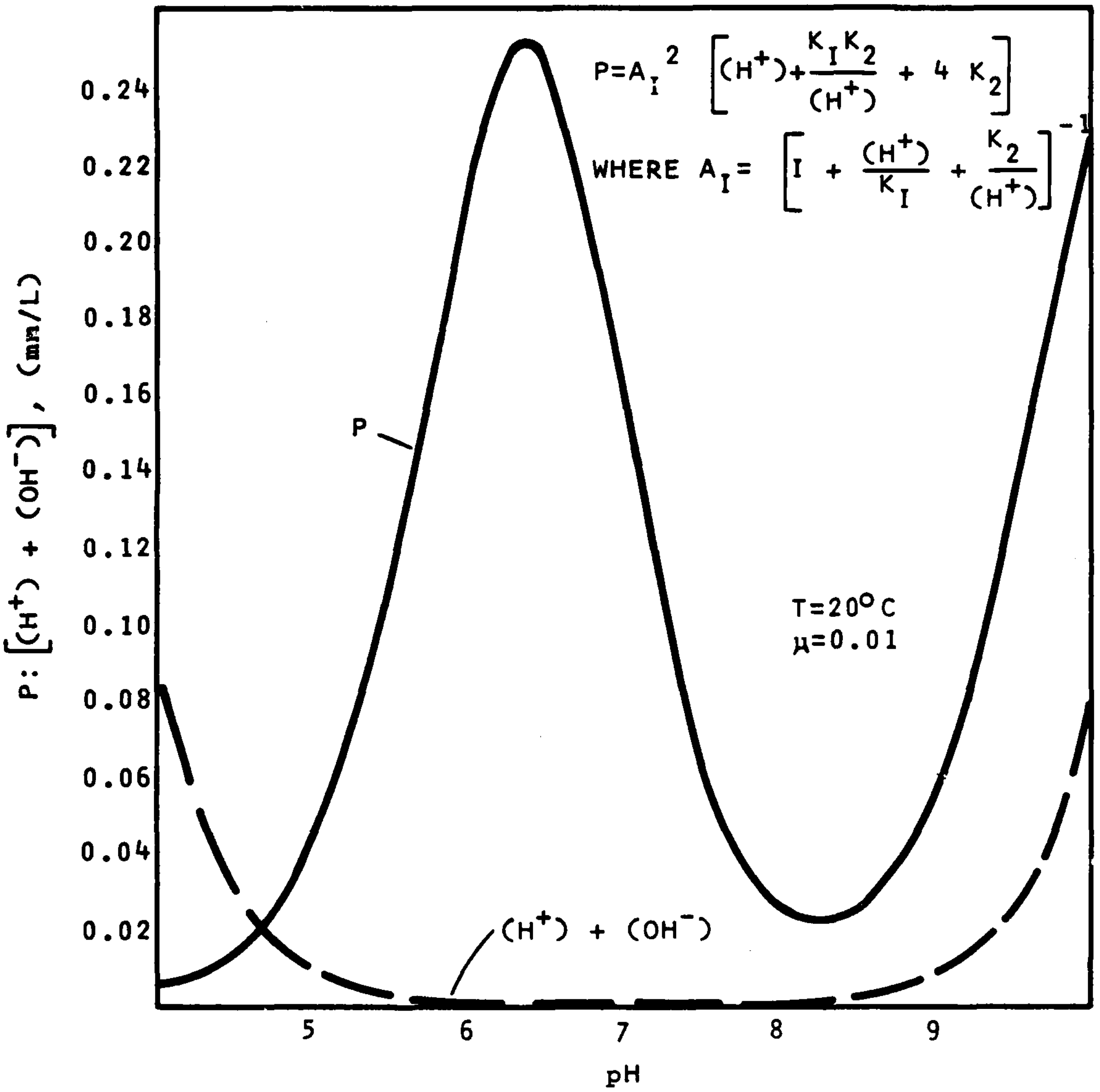
Trussell and Thomas (1971) have developed a two step method for calculating the buffer intensity. First, the total carbonate, bicarbonate and carbon dioxide, or Tco_2 is determined using equation 1, below, substituting A and C values obtained from Figure I.9-3. Second, the buffer intensity is determined from equation 2 using values of P and $((H^+) + (OH^-))$ from Figure I.9-4.

$$Tco_2 = \frac{Alk-C}{A} \tag{1}$$

$$B = 2.3\ (Tco_2 \cdot P + (H^+) + (OH^-)) \tag{2}$$



BUFFER INTENSITY
CONSTANTS A AND C AS FUNCTIONS OF pH
FIGURE I. 9-3



VARIATION OF BUFFERING COEFFICIENTS WITH pH

FIGURE I. 9-4

Langelier Index

The Langlier index (LI) is another indicator of the potential corrosivity of the water. Alkalinity, pH, calcium concentration, and ionic strength are the variables which directly affect the Langlier index. When LI<0 the water is potentially corrosive or aggressive and when LI>0, the water is considered non-corrosive; as previously discussed, it should not be assumed that the LI accounts for all potential sources of finished water corrosivity.

Langlier index calculations are based on the Standard Methods (14th ed., page 61) protocol which utilizes the following equation.

$$LI = pHs + \log(Ca^{2+}) + \log(Alk) - A - B \qquad (3)$$

where: A is a function of water temperature
B is a function of total dissolved solids, TDS

Ionic strength is related to TDS and is incorporated into the calculation in terms of mg/L-TDS.

Larson's Ratio

The corrosive tendency of water to the particular metal used in the pipelines of distribution systems can be significantly influenced by the level of total dissolved solids (TDS) in the water. According to Obrecht and Myers (1975), waters containing a TDS level exceeding 150 mg/L may exhibit corrosive tendencies and LI should be used only as a general guide. The TDS concentrations of the Phase I and Phase IIA finished water are 261 and 304 mg/L, respectively, suggesting corrosive tendencies. The presence of various anions in the water will increase its conductivity, accelerating corrosion. In addition, the anions may interfere with the formation and maintenance of a uniform protective $CaCO_3$ layer on the metal surfaces.

The principal anions are divided into two groups, those which are aggressive or accelerate corrosion and those which are nonaggressive or passivate corrosion. Chloride and sulfate are recognized as the principal aggressive anions and bicarbonate as the nonaggressive anion. Larson's ratio relates the equivalent weights of aggressive to nonaggressive anions as defined by equation 4 below (Larson, 1975).

$$LR = \frac{(Cl^-, \text{equiv. wt.}) + (SO_4^{2}, \text{equiv. wt.})}{(\text{alkalinity as } CaCO_3, \text{equiv. wt.})} \qquad (4)$$

Values of LR are always above zero, with higher values indicating more aggressive or corrosive water. Merill and Shanks (1977) have suggested that to maintain a protective film on pipe surfaces, the calcium and alkalinity concentrations should be at least 40 mg/L-$CaCO_3$ and the ratio of chloride and sulfate to alkalinity should be at most 1:5.

EXPERIMENTAL PLAN

The three metals selected for the corrosion test are copper, galvanized steel and black iron. For each metal three inserts were tested during each of the corrosion studies. Table I.9-1 summarizes the dates and duration of time for which each insert was tested.

TABLE I.9-1

EXPERIMENTAL SCHEDULES - PHASE 1 AND PHASE 2

	Date In	Date Out	Duration Days
Phase I			
#1 Inserts	3 Feb 1982	3 May 1982	89
#2 Inserts	3 Feb 1982	2 July 1982	149
#3 Inserts	3 May 1982	2 July 1982	60
Phase II			
#1 Inserts	14 Oct 1982	3 Jan 1983	82
#2 Inserts	14 Oct 1982	3 Mar 1983	142
#3 Inserts	3 Jan 1983	3 Mar 1983	60

The corrosion test was set up as a side-stream study on EEWTP finished water. Figure I.9-5 is a schematic of the experimental set-up and indicates the placement of each metal insert. Each pipe insert fits into one of the grooves which were routed out in three of the PVC pipe sections. Influent and effluent valves allowed the flow through each line to be adjusted. The flow for each line was monitored by a corresponding accumulating meter.

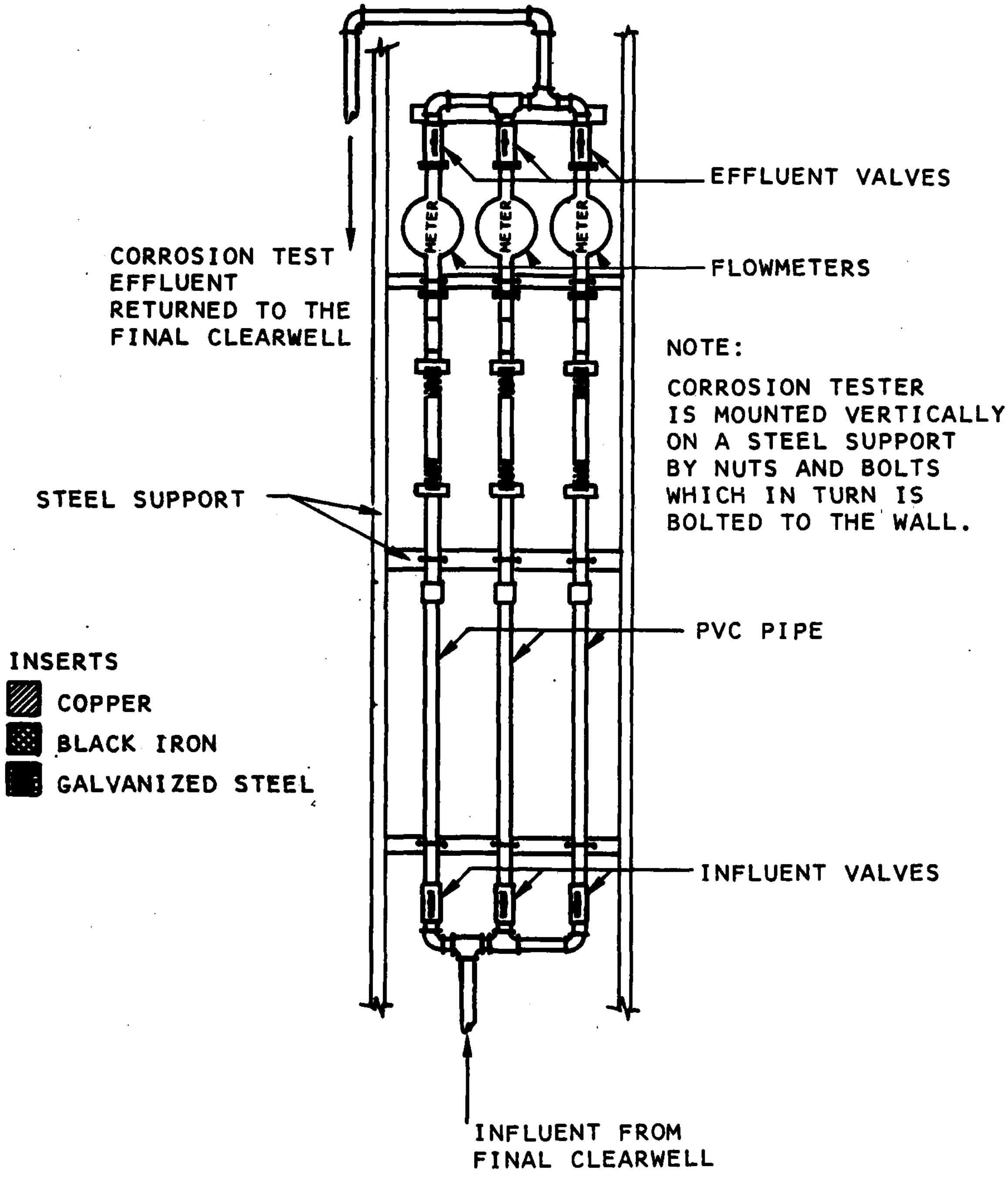
Directly after removal from the corrosion tester each insert was cleaned and weighed. The data provided information pertaining to the rate of corrosion for each metal after approximately two, three, and five months of contact with the finished water.

METHODS

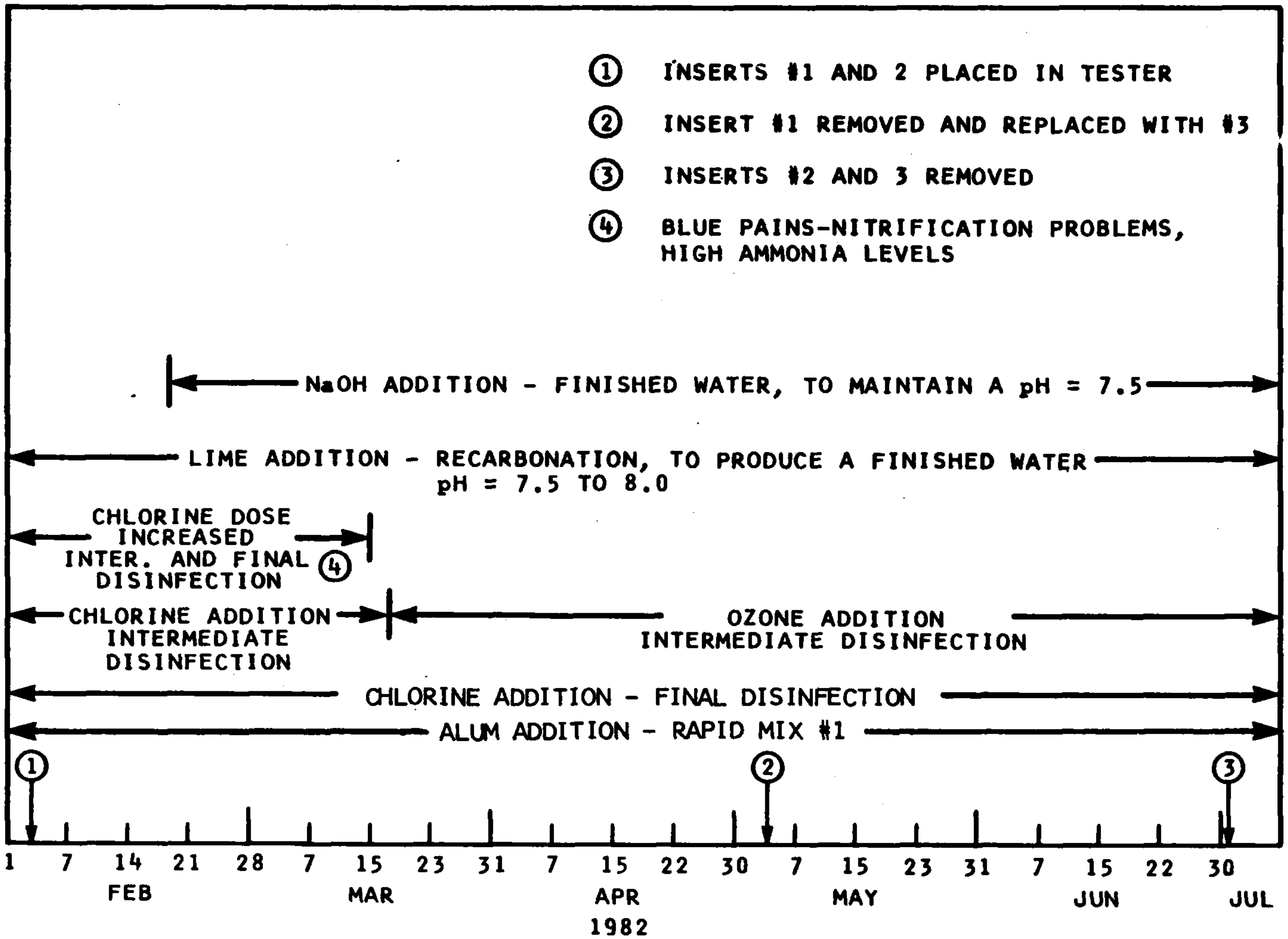
A general procedural outline for the ISWS is shown in Table I.9-2. For a more detailed description of the procedure refer to ASTM Annual Book of Standards, Water Section, C 2688 70, page 170.

DISCUSSION OF RESULTS

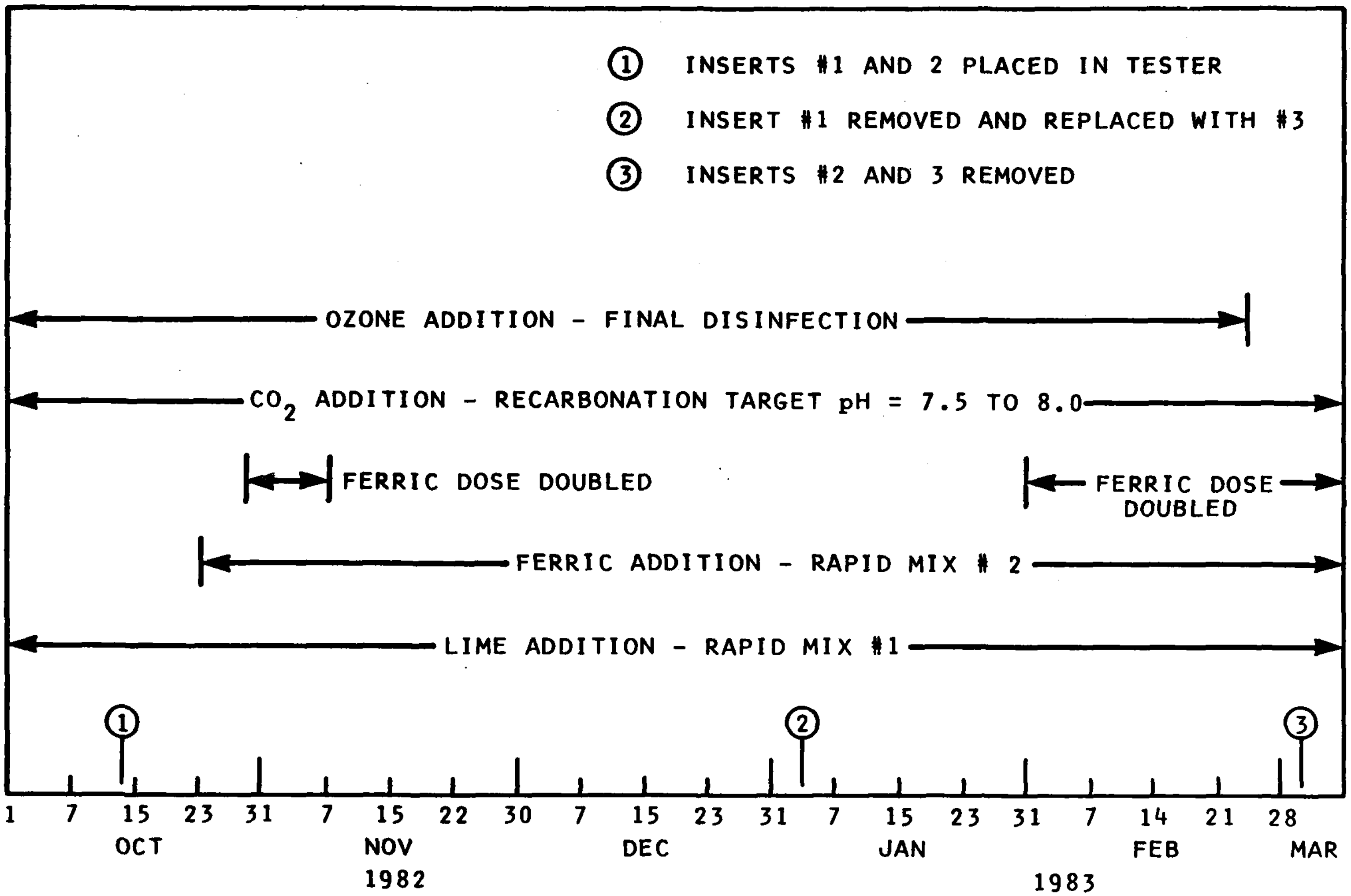
As stated previously, two corrosion tests were conducted, one during each phase of plant-scale operation. Figures I.9-6 and I.9-7 summarize the major chemical additions which took place during the corrosion test of Phase I and Phase II,



SCHEMATIC OF CORROSION TESTER
FIGURE I. 9-5



CHEMICAL ADDITION TIME SCHEMATIC - PHASE I CORROSION TEST
FIGURE I. 9-6



CHEMICAL ADDITION TIME SCHEMATIC - PHASE II CORROSION TEST
FIGURE I. 9-7

TABLE I.9-2

CORROSION TESTING - EXPERIMENTAL PROTOCOL

1. Stamp each insert with an identification number on the exterior surface.

2. Degrease inserts with trichloroethylene and air dry.

3. Remove rust by first placing inserts in an inhibited hydrochloric acid solution, then water, and finally a passivating solution. Air dry the inserts and store in a dessicator. Special instructions are required for galvanized steel and copper. See reference.

4. Weigh each insert to the nearest 0.001 gm.

5. Mix equal parts of epoxy, catalyst and solvent and coat only the exterior of each insert.

6. Store inserts in a dessicator until they are installed in the corrosion tester.

7. Install inserts in the corrosion tester and set the flow through each line at 5 gpm.

8. At specified times remove inserts and carefully record the exterior and interior conditions of each insert. If the exterior surfaces show signs of appreciable corrosion, the results will be highly questionable. A photograph of each insert is highly recommended.

9. Dry inserts at 105°C for 24 hours; place copper insert in a dessicator for 24 hours to dry.

10. Subject exterior only of each insert to an epoxy paint stripper and remove all paint.

11. Dry inserts at 105°C for one hour and cool in a dessicator one hour. Follow step 9 for drying copper inserts.

12. Weigh each insert to the nearest 0.001 gm.

13. Using a spatula and then a brush and scouring powder, remove loose deposits and wash the inserts, respectively.

14. Dry and weigh inserts according to steps 9 and 12.
15. Chemically clean each insert according to the referenced instructions.

16. Rinse inserts with water followed by acetone.

17. Dry and weigh inserts according to steps 9 and 12.

18. Calculate the corrosion rate and penetration for each insert.

respectively. For each metal tested, copper, black iron and galvanized steel, three sections of pipe were prepared and inserted into the testing apparatus over the course of each test. Time of insertion and removal for each pipe insert are indicated in Figures I.9-6 and I.9-7.

Upon removal of the pipe inserts from the corrosion test apparatus, they were visually inspected for accumulated corrosion products. For both phases, the black iron inserts had the greatest visible accumulation of corrosion deposits followed by galvanized steel and then copper. In addition, inserts subjected to the finished water of both phases for the two and three month durations appeared to have a greater amount of corrosion products on the interior surface than the five month inserts. Also, the accumulated corrosion deposits on the inserts from the Phase I test were visually greater than the Phase IIA desposits.

The interior of the black iron inserts were coated with reddish-brown tubercles possessing occasional flecks of a white corrosion product. Corrosion deposits within the galvanized steel inserts were white in color and formed rows paralleling the length of the inserts. The corrosion product which formed on the interior of the copper inserts was a very fine layer of a reddish-brown material.

Once the inserts were cleaned, according to the experimental procedures outlined in Table I.9-2, they were visually inspected for pitting. The copper inserts for both phases did not appear to have any pitting marks, the interior surfaces were relatively smooth with brush-fine grooves produced during the manufacturing process. Black iron and galvanized steel inserts exhibited pitting and/or patchy removal of the interior pipe surfaces which appeared to increase with exposure time.

The black iron Phase I inserts exhibited a patchy-type removal where the patches were 0.17 to 0.33 inches wide by 0.5 inches long. Also, pin-point size pits were present on the three month insert and were increased in number on the five month insert. Phase IIA black iron inserts did not exhibit patchy-type removal but instead had pronounced circular pit marks on the interior surface which ranged in size from pin-point to 0.08 inches in diameter. Instruments were not available for measuring the depth of the pits; however, visual estimation of pit depth was approximately 0.01 inches. The pitting action was almost non-existent on the interior surface of the two month insert and virtually covered the five month insert interior surface. This observed pitting of the five month Phase IIA black iron insert was noticeably more severe than in any of the other inserts.

The galvanized steel inserts for both phases did not exhibit pit marks but instead, a wearing down of the interior galvanized surface of the steel pipe. Phase I two month inserts showed no signs of corrosion while the three and five month inserts had a mottled appearance with some of the galvanized material present and some corroded away. Unlike the pit marks, the mottled-type marks did not exhibit a visually measurable depth. The interior surfaces of all three Phase IIA inserts were completely stripped of the galvanized material. Corrosion of the galvanized layer appeared to have occurred by the wearing down of the layer as a whole instead of a patchy, pit or mottled type removal.

The results of the corrosion tests were recorded in terms of weight loss (g/m^2d) and are presented in Figures I.9-8 and I.9-9 for Phase I and Phase IIA, respectively. In all cases, excluding Phase IIA black iron, the rate of corrosion decreased with increasing time. This slowing down of the corrosion reaction with increasing exposure time is attributed to the build-up of corrosion products at the corrosion sites on the interior surface of the inserts. Reduction of the rate of corrosion with time is indicated by the decreasing slopes associated with the two, three and five month data points in Figures I.9-6 and I.9-7. Table I.9-3 is a summary of corrosion weight loss data obtained from a test similar to the EEWTP corrosion test conducted in Portland, Oregon by James M. Montgomery, Consulting Engineers, Inc. (1982). The three and six month data in this table are further support for the concept that the rate of corrosion decreases with time.

TABLE I.9-3

PORTLAND, OREGON CORROSION TEST
BULL RUN

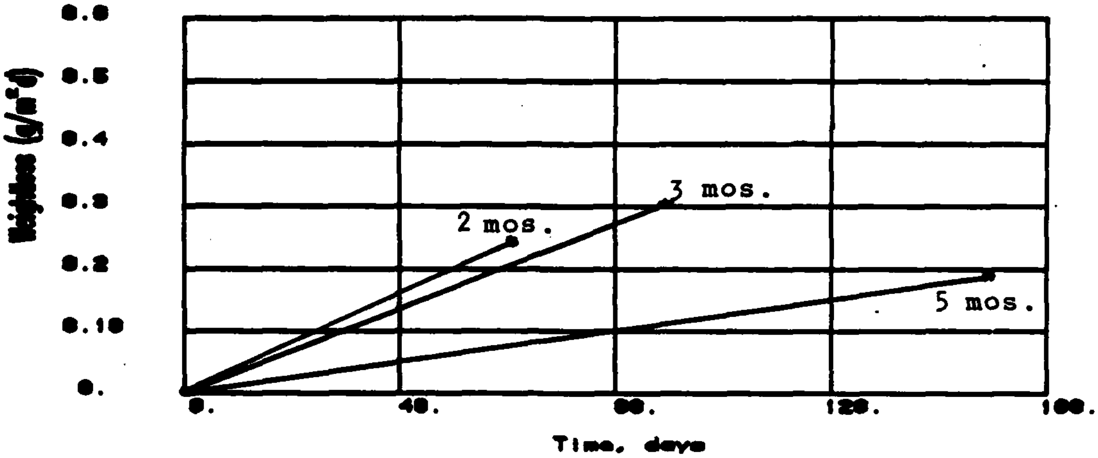
Parameter	Weight Loss g/m^2d 3 Months[1]		6 Months[2]
Copper	.36		.22
Black Iron	2.2		1.8
Galvanized Steel	.41		.30
		Indices	
Buffer Intensity		.10	
Langelier Index		-3.0	
Larson's Ratio		.30	

1. 3 Months = 90 days
2. 6 months = 180 days

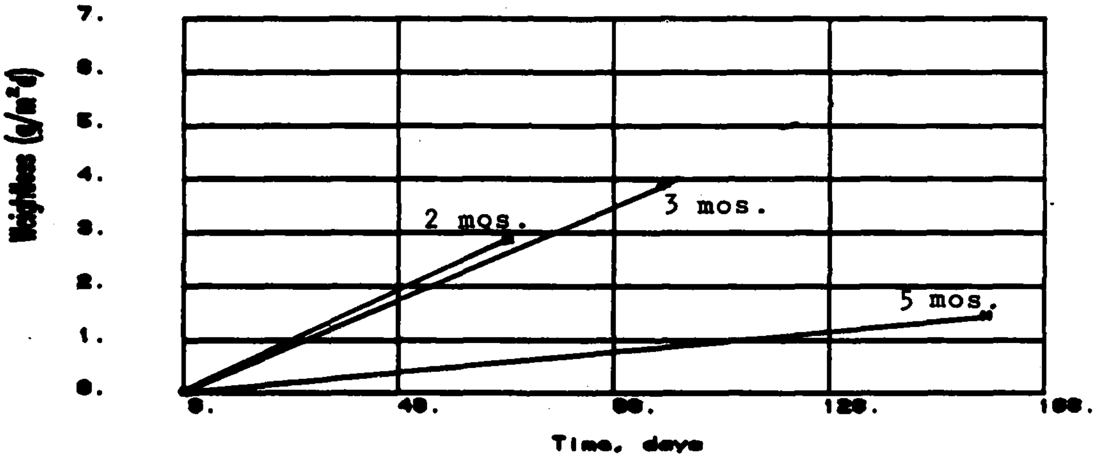
The weight loss data for both phases, associated with the three month exposure time, are summarized, along with penetration calculations, in Table I.9-4. A comparison of the results for the two phases and three metals indicate the following:

(a) The black iron inserts corroded the most followed by galvanized steel and then copper.

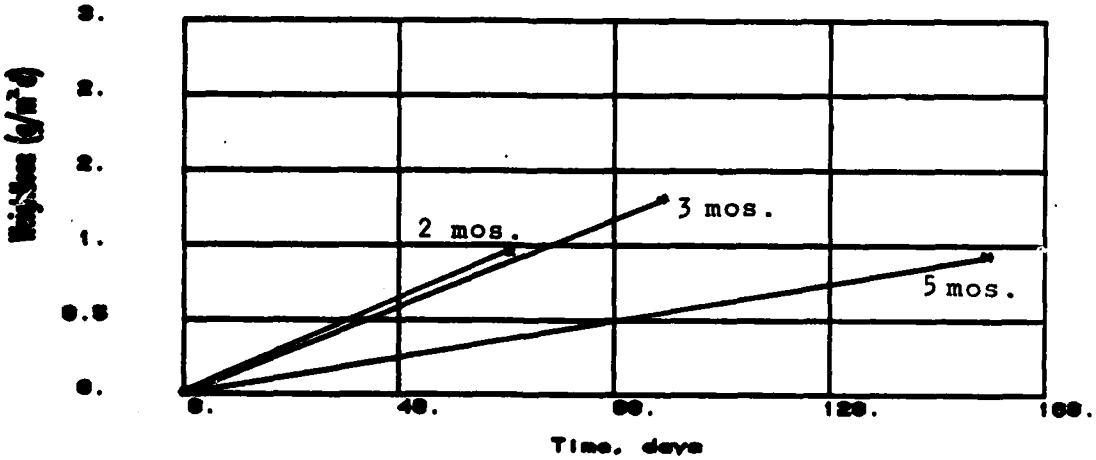
(b) Corrosion of the copper inserts was on the average 15 percent of the levels which occurred for the other two metals. Also, Phase IIA corrosion weight loss for copper was twenty percent higher than Phase I.



(a) Copper

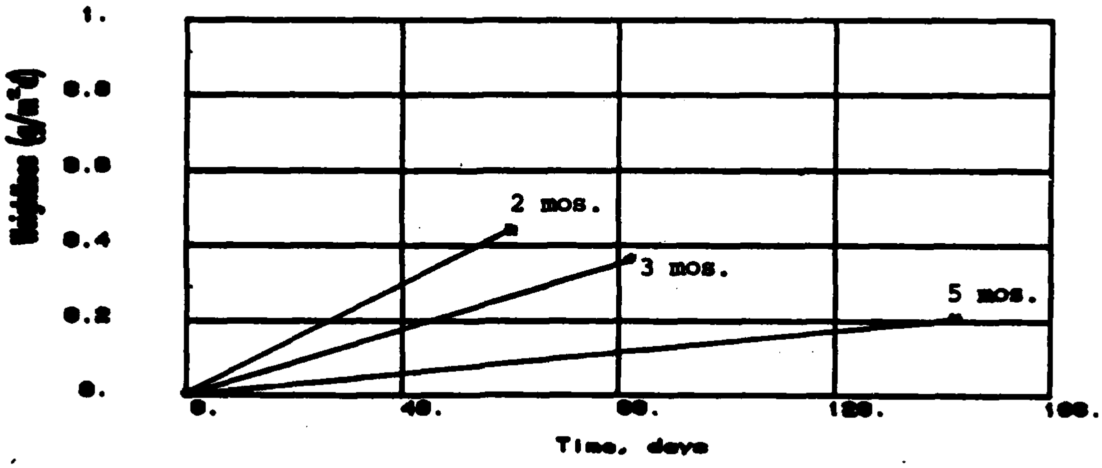


(b) Black Iron

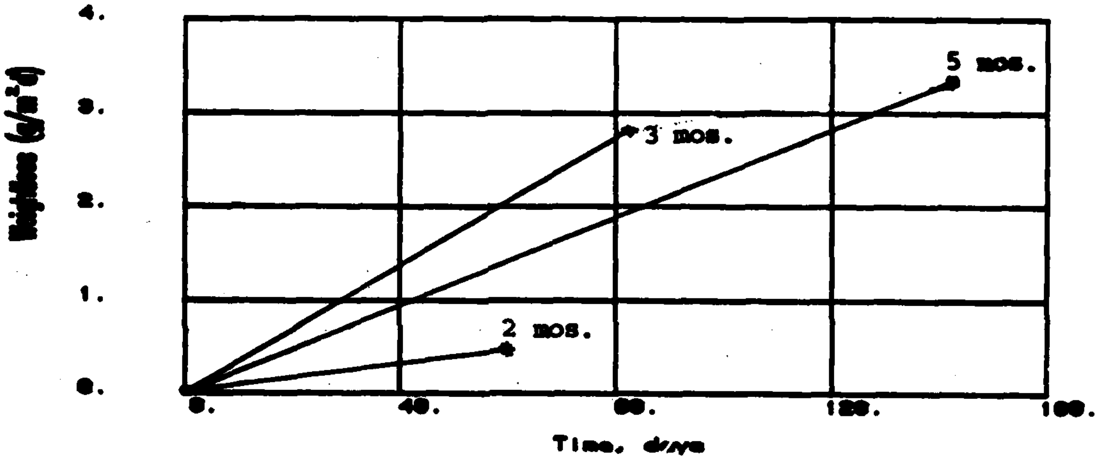


(c) Galvanized Steel

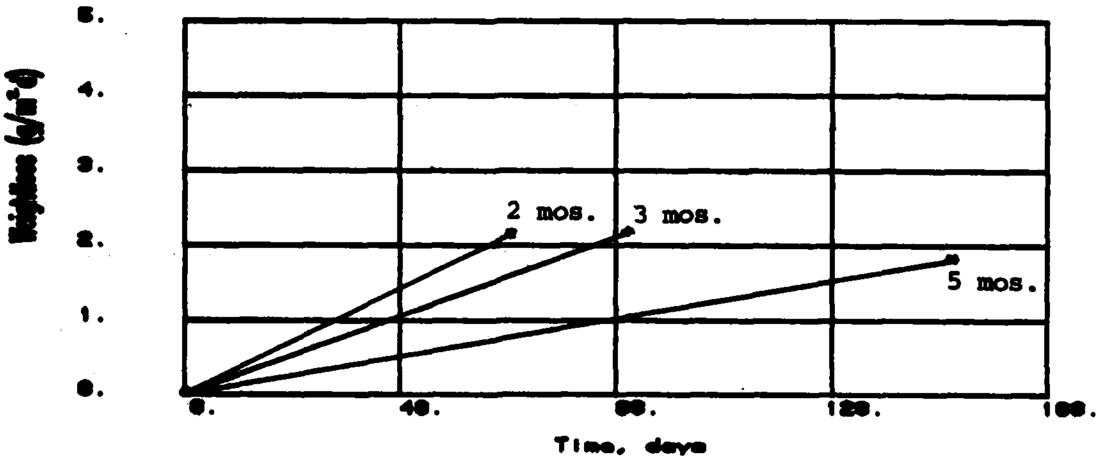
CORROSION TEST WEIGHTLOSS
PHASE I
FIGURE I. 9-8



(a) Copper



(b) Black Iron



(c) Galvanized Steel

CORROSION TEST WEIGHTLOSS

PHASE II A

FIGURE I. 9-9

(c) The black iron weight loss for Phase I was 35 percent higher than the level for Phase IIA.

(d) Galvanized steel corroded seventy percent more in the Phase IIA finished water as compared to Phase I.

In general, for two out of the three metals tested (copper and galvanized steel), the finished water of Phase II was more corrosive.

TABLE I.9-4

CORROSION RATES
FOR THREE MONTH DURATION

	Weightloss g/m^2d		Penetration mmpy	
	Phase I	Phase II	Phase I	Phase II
Copper	.30	.36	.012	.015
Black Iron	3.8	2.8	.18	.13
Galvanized Steel	1.3	2.2	.06	.11

Results from the two month and five month pipe inserts indicated similar trends between Phases I and II to those observed in the first (three month) set of inserts as shown in Figures I.9-8 and I.9-9. The only exception was the five month black iron results, for which the Phase II insert was considerably more corroded than that for Phase I.

Table I.9-5 is a summary of three corrosion indices (buffer intensity, Langlier index and Larson's ratio) calculated for the EEWTP finished water of Phase I and Phase II. These indices are often used as operational guides in the water treatment industry. Each of the three indices indicates that the Phase I finished water was more corrosive than Phase II. Material properties of the distribution pipelines are not factored into the equations for indices, which are used only as indicators of corrosion potential. The results of the corrosion test coupled with the indices calculations suggest that, while the indices might provide information pertaining to the water's corrosion potential, a more rigorous test should be conducted to accurately evaluate the rate of corrosion for specific pipeline materials.

TABLE I.9-5

CORROSION INDICES

	Phase I	Phase II
Buffer Intensity	.27	.41
Langlier Index	-.84	-.10
Larson's Ratio	2.60	1.43

CONCLUSIONS AND RECOMMENDATIONS

With respect to the three materials tested (copper, black iron and galvanized steel), weight loss and penetration rates were always highest for black iron and lowest for copper. The Phase II corrosion test results indicate an increase in the corrosion rates for copper and galvanized steel relative to the Phase I results, despite the fact that calculated corrosion indices suggest Phase II is less corrosive than Phase I. Corrosion test results for black iron followed the tendencies suggested by the corrosion indices, Phase I being more corrosive than Phase II.

Visual observations indicated both the black iron and galvanized steel inserts had pitting, patchy removal or wearing down of the interior surface. The copper inserts exhibited no visible disruption of the interior surface due to corrosion. Pitting of the interior surface of the black iron inserts utilized during the Phase II test are not well understood, but it is suspected that residual ozone or ozone by-products might be attacking the inserts even after two hours of detention since ozonation. In light of the measured corrosion indices, however, it seems unlikely that similar corrosivity would be observed in the more remote piping of a distribution system.

Using the results from this limited study, several general recommendations can be formulated as discussed below:

1. A comparison of the calculated corrosion indices with the corrosion test results suggests that rigorous tests should always be conducted to evaluate the corrosional effects of a finished water on specified pipe materials. Corrosion indices can be used as operational tools; however, their effectiveness for this purpose should first be determined through a corrosion test similar to the one described herein.

2. The plant-scale test results indicate that Phase I finished water was less corrosive than the Phase II water. pH control measures, in the form of lime addition at the sedimentation effluent and sodium hydroxide addition at the GAC effluent, did serve to reduce the corrosivity of the water and are recommended for full scale application. The efficacy of these measures may be reflected in the relatively low corrosion rates observed in the special study reported here.

3. With respect to Phase II operation, the corrosion indices (buffer intensity, Langelier index and Larson's ratio) suggest the need for additional

corrosion control is not necessary. However, corrosion test results indicated a potential for corrosion (including noticeable pitting in black iron) which was not fully resolved. On the hypothesis that such corrosion is related to the use of ozone, the selection of process piping following ozonation should be carefully considered.

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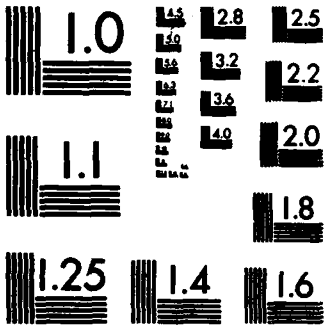


MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

SECTION 10

PLANT-SCALE EVALUATIONS

INTRODUCTION

In addition to the bench-scale and pilot-scale studies which have been previously discussed, additional engineering investigations were conducted to further evaluate the plant-scale unit processes at the EEWTP. These studies were designed to provide supplemental plant-scale information beyond what was available from the Routine Water Quality Monitoring Program, and are described more fully in the sections which follow.

HYDRAULIC CHARACTERIZATION

The efficiencies of many water treatment processes depend upon the hydraulic characteristics of the process basins. This is especially true for mixing compartments, flocculation, and sedimentation basins, where the fluid detention time and flow patterns are two of the hydraulic characteristics which most noticeably influence the efficiency of the process.

Mixing, flocculation and sedimentation processes often do not perform as well as expected. One of the primary reasons for poor performance is short-circuiting, which can be simply defined as the passage of a slug of water through a basin in less than the theoretical detention time:

$$T = V/Q$$

where
T = theoretical passage time (min)
V = volume of basin (gal)
Q = flow rate through basin (gpm)

The main causes for short-circuiting include physical factors (e.g., density, thermal and wind-induced currents) and design factors (e.g., non-uniform flow distribution and collection). Because of the physical factors, all basins short-circuit to some degree. Hence, the optimum basin design is one that minimizes the physical factors and avoids creating the design-oriented factors.

In order to obtain a better perspective for reviewing process performance, the blend tank, aeration basin, mixing and flocculation tanks, and the sedimentation basin at the EEWTP were all evaluated for hydraulic performance. Other unit processes were tested during the second six months of operation.

TRACER TEST METHOD

Tracer studies are commonly made by injecting a slug dose of dye, radioactive substance or salt solution into the influent of a basin and measuring the

concentration of the injected tracer in the effluent at various time intervals. The effluent monitoring should be carried on until substantially all of the tracer has passed through the basin.

Lithium chloride (LiCl) was used as the tracer in the EEWTP studies (i.e., Li was measured in the effluent samples). This particular salt was selected because it does not possess the disadvantages of contaminating the water with organics (dyes) or radiological parameters. The background level of lithium is low enough (generally about 4-5 ng/L) so that the required amount of added LiCl was not great enough to create density currents.

A single tracer study was made on each of the basins in question. Tracer was injected at six locations in the plant (see Figure I.10-1):

1. Downflow piping feeding to the final disinfection clearwell (not shown in Figure I.10-1)
2. Pressurized piping feeding the lead carbon column (not shown in Figure I.10-1)
3. Rapid mix tank effluent overflow
4. Aeration tank effluent channel
5. Blend tank overflow weir
6. Microscreen effluent trough, at outlet

Flows at these locations were sufficiently confined such that a one liter slug of concentrated (100 g/L) tracer solution could be easily distributed through the entire process flow. Tracer studies of downstream processes were completed first in order to avoid any possible contamination from lithium residuals remaining from upstream studies.

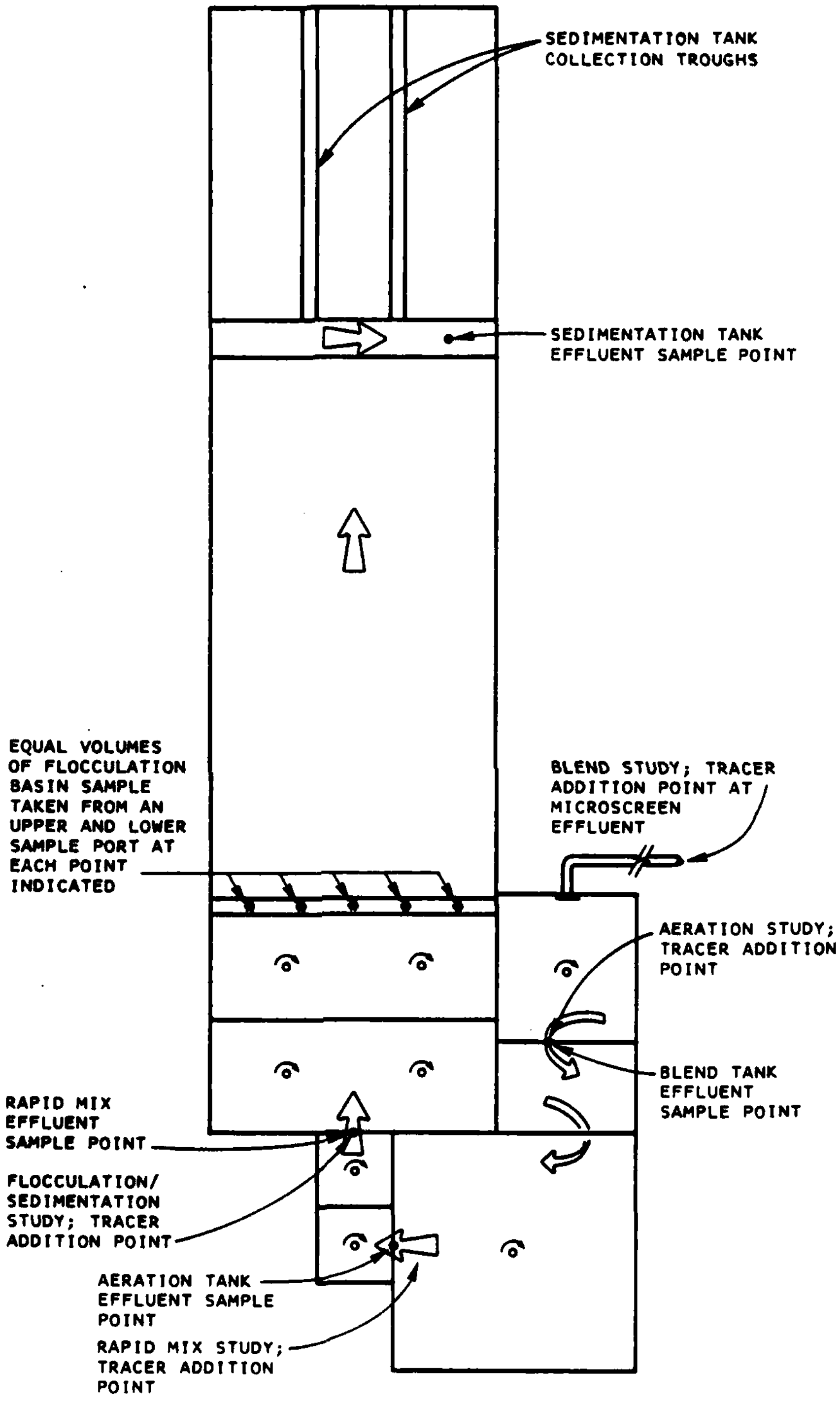
The tracer injections cited above served as influent slugs to the following processes, respectively:

1. Chlorine contact tank
2. Lead and lag carbon columns
3. Flocculation and sedimentation
4. Rapid mix
5. Aeration
6. Blending

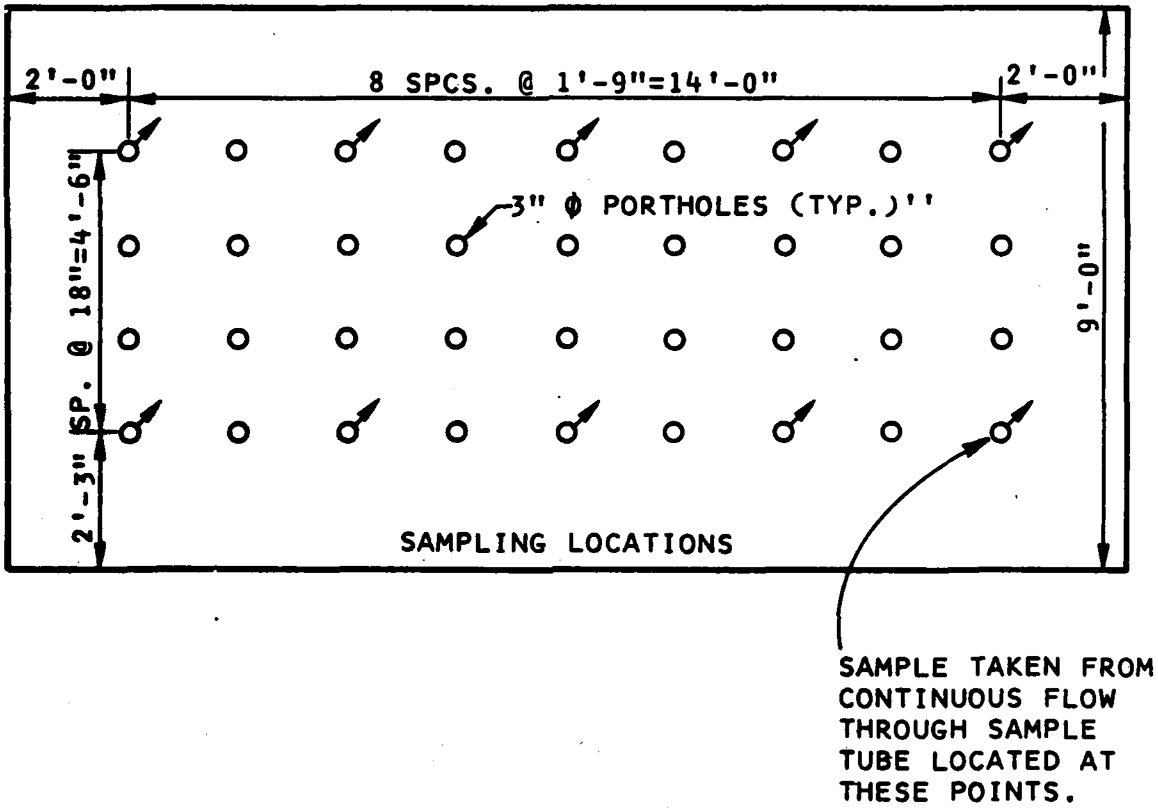
Chlorine contact tank effluent samples were collected at the tank discharge port, through the final plant sampling pump and tap. Samples were collected at evenly spaced time intervals.

Samples from the GAC contactor study, conducted on a different date, were collected at effluent taps from both the lead and lag carbon columns.

Effluent samples for the sedimentation basin were collected at the combined effluent trough feeding the recarbonation basin. Flocculation basin effluent samples were collected from ten evenly spaced locations across the flocculation effluent diffuser wall (see Figure I.10-2). Sample was collected at the specified intervals from continuously flowing sample tubes installed at each location.



HYDRAULIC CHARACTERIZATION
TRACER INJECTION AND SAMPLING POINTS
FIGURE I. 10-1



TRACER SAMPLING LOCATIONS IN FLOCCULATION BASIN EFFLUENT DIFFUSER WALL

FIGURE I. 10-2

Samples from each location were composited into a combined sample representing flocculation effluent at that point in time.

Rapid mix and aeration basin effluents were collected from the effluent overflow channels from those basins. Blend tank effluent was collected from the V-notch weir at the effluent of the first stage blend tank. As with the tracer injection, confinement of flows at these points ensured a representative sample.

Figure I.10-1 shows the locations of the tracer injection and effluent monitoring points for the blend tank to sedimentation effluent sampling areas.

THEORETICAL CONSIDERATIONS

A convenient method of plotting tracer data is in dimensionless terms. As shown in Figure I.10-3, the ordinate axis on a dimensionless tracer curve consists of the relative concentration rates - the actual tracer concentration measured (C) divided by the tracer concentration which would be obtained if the injection of tracer were completely mixed instantaneously throughout the entire basin volume (C_o). The abscissa axis consists of the relative time ratio - the actual time (t) divided by the theoretical detention time (T). The advantage of dimensionless tracer curves is that the plot is independent of basin theorectical detention time and the amount of tracer injected. Thus, such dimensionless curves enable comparisons of hydraulic characteristics for different basins.

Figure I.10-3 shows typical tracer curves for basins of different types (Camp, 1946). Curve A shows the flow conditions for an ideal plug flow basins, where the injected tracer does not mix with basin contents, but travels as a distinct slug throughout the entire basin length. Therefore, the peak tracer concentration (t_p) occurs at the theoretical detention time (t/T = 1). Curves B, C, and D are progressively inferior in effective detention time, since the relative time ratio at which t_p occurs is increasingly less than unity. Curve D represents an ideally mixed basin in which C_o (the instantaneously mixed concentration) is achieved immediately. Effluent concentrations gradually taper off according to the formula:

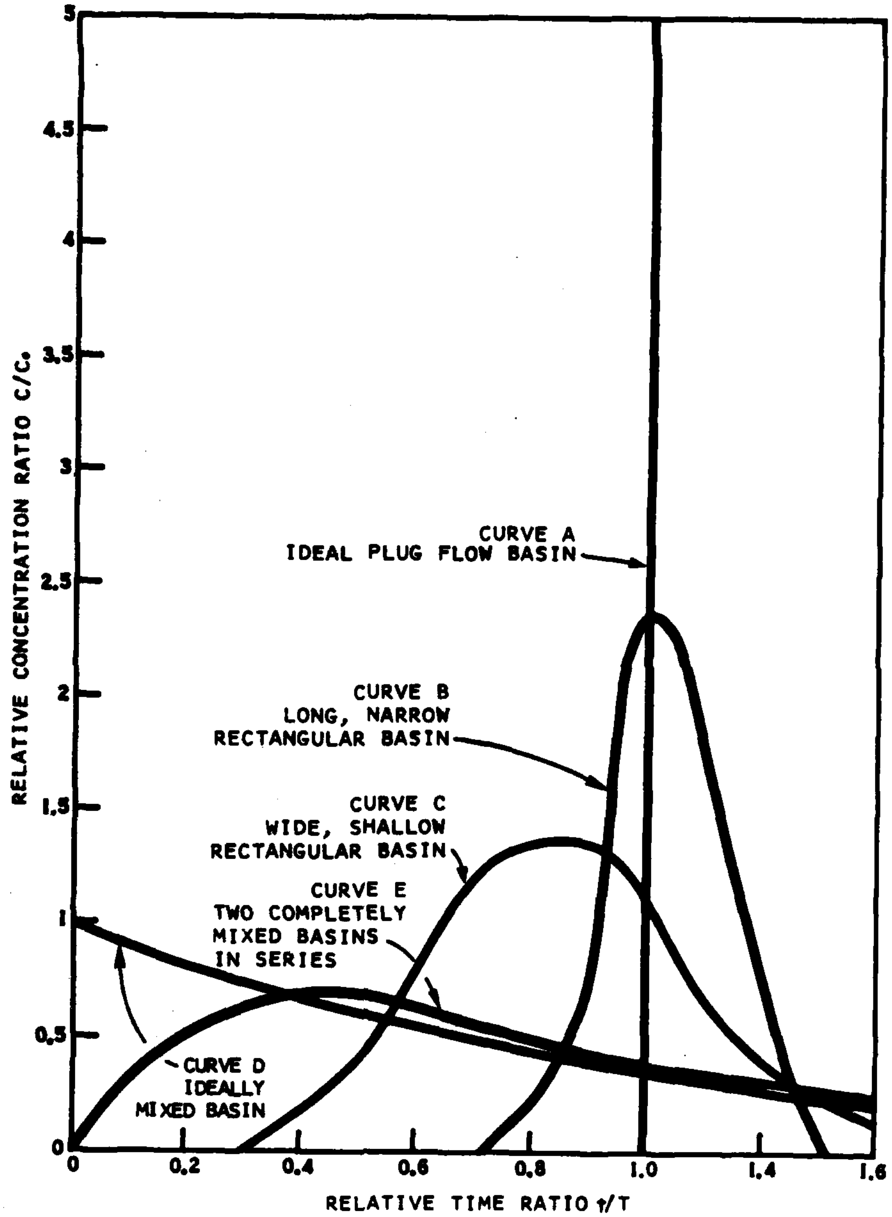
$$C/C_o = e^{-t/T}$$

Curve E represents two such basins of equal size and dimensions in series. In this case, T represents the total detention time of both basins and C_o represents the concentration of tracer if instantaneously mixed through both basins. The theoretical curve follows the relationship:

$$C/C_o = 4^{t/Te^{-2t/T}}$$

In addition to tracer curves, there are a number of other parameters of concern in tracer studies. The most important parameters are discussed below:

1. Dispersion Number (d). The dispersion number describes the longitudinal dispersion of the tracer, including backmixing and intermixing; see discussion of dispersion model below.



TYPICAL TRACER CURVES
FIGURE I. 10-3

2. Initial Tracer Appearance (t_i). The value of t_i also measures the dispersion of fluid in a basins. The smaller the value of t_i/T, the more rapid the dispersion and the more serious the short-circuiting.

3. Centroid of the Tracer Curve (t_a/T). The value of the center of gravity of the tracer curve is a measure of the average detention time in the basin. Dead spaces will reduce t_a/T from its theoretical value of 1.0

4. Median of the Tracer Curve (t_h). The shorter the time until fifty percent passage of the tracer through the basin (t_h) the worse the short-circuiting. Half the tracer passes in less than t_h, the median detention time of the basin.

5. Tracer Peak (t_p). The value of t_p/T is an indication of the extent of plug flow. For example, the existence of a laminar sublayer (density current) would carry the peak tracer concentration in a stream along the basin bottom, instead of as a slug throughout the depth of the basin. Hence, t_p/T would be far less than unity.

6. Morril Index (t_{90}/t_{10}). The ratio of the time of ninety percent tracer passage to ten percent tracer passage indicates the degree of mixing and uniformity of flow in a basin. The greater the longitudinal mixing, the higher the value of the Morril Index. Conversely, a small Morril Index indicates that the water receives a more uniform treatment.

Mixed Flow Versus Plug Flow

Certain limitations exist in using only the above parameters in analyzing tracer tests, since none allow quantitative determination of the extent of plug flow, mixed flow and dead spaces in a basin. Therefore, using recently developed methods, the EEWTP tests were analyzed to yield the degree of these three important basin flow characteristics.

The method of analysis (Rebham, 1965) is based on an emperical function, F(t) representing the fraction of fluid with detention time less than t, having the form:

$$F(t) = 1 - e^{-a(t-\phi)T}$$

a and ϕ are constants which are related to the percent of mixed flow, plug flow, and dead space in the flow regime, as derived from material balance considerations. Using the entire flow curve and graphical techniques, it is possible to calculate hypothetical percentages of each type of flow. For a further description of this method, the reader is referred to the reference source (Rebham and Aragman, 1965).

Dispersion Model

For certain processes, such as final chlorination, it is useful to examine the data in terms of the extent of backmixing and/or intermixing, the magnitude of which is independent on position in the tank. This condition implies that there is no

gross by-passing or short-circuitry and is modeled by the dispersed plug flow, or "dispersion" model (Levenspiel, 1972). This model is generally quite satisfactory for flow that does not diverge too far from plug flow conditions. The model has additional advantages from the standpoint of chemical kinetics and facilitates a mathematical description of the completion of a chemical reaction, given the disperson number and the basic kinetic equation of the reaction (Trussell and Chao, 1972).

The reader is referred to Trussell and Chao (1972) and Levenspiel (1972) for a more full explanation of the model. Application of the dispersion model to the tracer studies of the EETWP chlorine contact tank is described under the "Discussion" section which follows.

TEST RESULTS

Blend Tank

Results for this basin are shown in Figure I.10-4 and listed in Table I.10-1. The basin very closely follows the theoretical curve for a completely mixed basin.

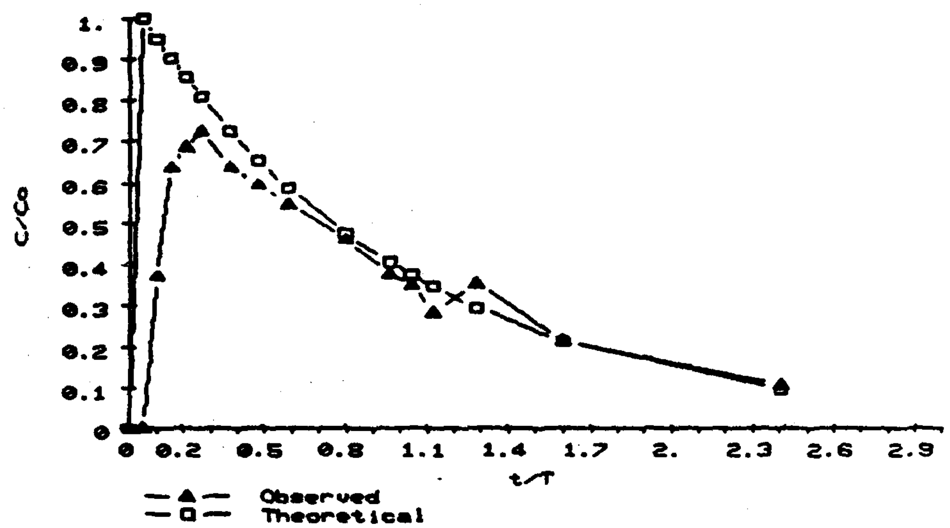
The Morril Index is quite high ($t_{90}/t_{10} = 19$), indicating that a high degree of longitudinal mixing occurs. The median and average detention times are both close to unity, indicating little, if any, short circuiting. This is verified by the computation of zero dead space. The appearance of the peak concentration of dye ($t_p/t = 0.21$) is somewhat delayed from what might be expected for a single completely mixed basin. This is most likely due to the effects of the influent baffle which, while assuring proper distribution and mixing, does provide a small volume of plug flow. Including this baffled portion, the overall mixed flow fraction of the blend tank (prior to the weir) is calculated as 92 percent.

In summary, the results of the test indicate good mixing in the blend tank with an average detention time approximately equal to theoretical.

Aeration Basin

Test results for the aeration basin, shown in Figure I.10-5, are somewhat more difficult to evaluate. Because influent to the aeration basin is submerged at an underflow baffle, it was necessary to inject the tracer at the upstream blend tank overflow weir. If plug flow is assumed in the small tank prior to the aeration basin, the tracer injection would be delayed by approximately 3.5 minutes or 16 percent of aerator detention time ($t/T = 0.16$). In fact, however, the overflow of the V-notch weir probably short circuits much of the basin.

For purposes of the analyses summarized in Table I.10-1, two extremes have been assumed: 1) a delay of influent spike (and appropriate corrections to t/T) based on plug flow through the second stage blend, and 2) no correction for t/T, basically simulating instantaneous passage through the preceding tank. C_o and T for both cases are based upon aeration tank volume alone. The actual tank flow regime should lie somewhere between these two simulated extremes, such that the results tabulated in Table I.10-1 should bracket the true response.

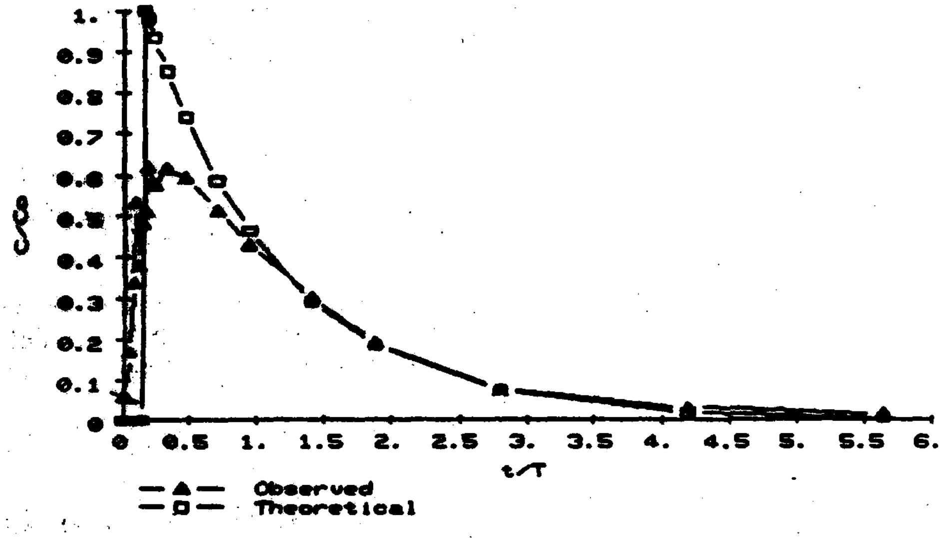


BLEND TANK
HYDRAULIC CHARACTERIZATION CURVES
FIGURE I. 10-4

TABLE I.10-1
TRACER STUDY RESULTS

	Blend Tank	Aeration Basin[1]	Rapid Mix Basins (Total for two in Series)	Flocculation Basins (Total for two in Series)	Combined Flocculation and Sedimentation Basins
Flow Rate (gpm)	362	359	359	339	340
Detetion Time, T (min)	6.24	21.4	2.06	41.3	314
% Lithium Recovered	89%	93%	90%	80%	72%
t_i/T	.051	-.11 to .05	.12	.048	.23
t_p/T	.21	.03 to .19	.73	.48	.23
t_{90}/t_{10}	19	34 to 11	5.8	6.5	7.1
t_b/T	.82	.77 to .93	.97	.80	.67
t_a/T	1.0	1.07 to 1.23	1.17	.91	0.90
Plug Flow Fraction	8%	1 to 14%	29%	31%	15%
Mixed Flow Fraction	92%	99 to 86%	71%	69%	85%
Dead Space Volume	0%	30 to -24%	-24%	5%	3%

1 Range of values reported correspond to two extremes for passage of the influent spike through second stage blend: 1) t/T is corrected to reflect an assumption of plug flow through the full basin volume, 2) t/T is uncorrected, reflecting an assumption of instantaneous passage through the basin.



AERATION TANK
HYDRAULIC CHARACTERIZATION CURVES
FIGURE I. 10-5

As can be seen in Figure I.10-5, the tracer effluent curve for the aerator closely matched the theoretical results for a completely mixed basin. Good mixing is confirmed by a high Morril Index (t_{90}/t_{10} between 11 and 34) and rapid appearance of the tracer peak (t_p/T = 0.03 to 0.19). The percent of mixed flow is also computed to be high: 99 percent with subtraction of plug flow through the preceding tank, and still at 86 percent if the flow through the preceding tank is included.

In summary, the aeration basin appears to perform similar to a completely mixed basin. Virtually all influent flow should be subjected to some degree of aeration; although actual contact time with the atmosphere is difficult to ascertain. Median contact time for the entire basin is computed to be between 77 and 93 percent of theoretical (21.4 minutes). However, of the total volume, only a certain fraction is in contact with the air at any given moment.

Rapid Mix Tanks

The rapid mix tanks behave almost exactly as two completely mixed basins in series, as shown by Figure I.10-6. As seen in Table I.10-1, the median and mean detention times are computed to be at and above unity, respectively.[1].

In general, all indices are typical for two completely mixed basins in series, including a combined flow regime analogous to approximately thirty percent plug flow. The close fit of Figure I.10-6, combined with high values of average detention time, indicate good mixing with little short circuiting.

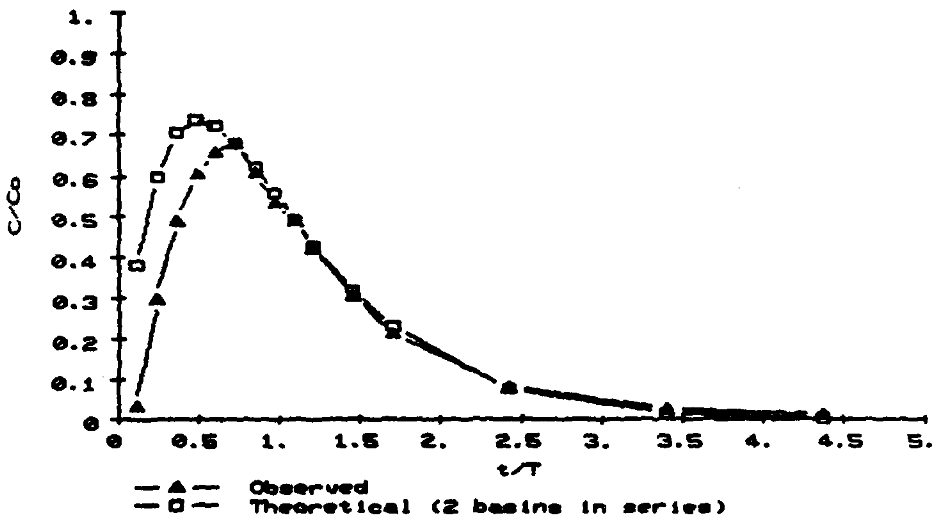
Flocculation Basins

The results for the flocculation basins during winter and late spring conditions are displayed in Figure I.10-7 and indicate little or no significant variations occurred between the two test periods. The results from the spring testing of 1981 are summarized in Table I.10-1. Both the flocculation basins and the rapid mix tanks behave quite closely to theoretical predictions for two mixed reactors in series.

Relatively high values of t_h/T (0.80) and t_a/T (0.91), indicate that there is little short circuiting. Computed dead space is also low, at only five percent.

The two mixed flow basins in series create a combined flow regime analogous to 29 percent plug flow. Although complete mixing is required for good flocculation, plug flow hydraulics are desirable to ensure that all particles are retained sufficiently long for good flocculation. As indicated by the Morril Index (t_{90}/t_{10} = 6.5) and early arrival of the peak concentration (t_p/T = 0.048), all particles are

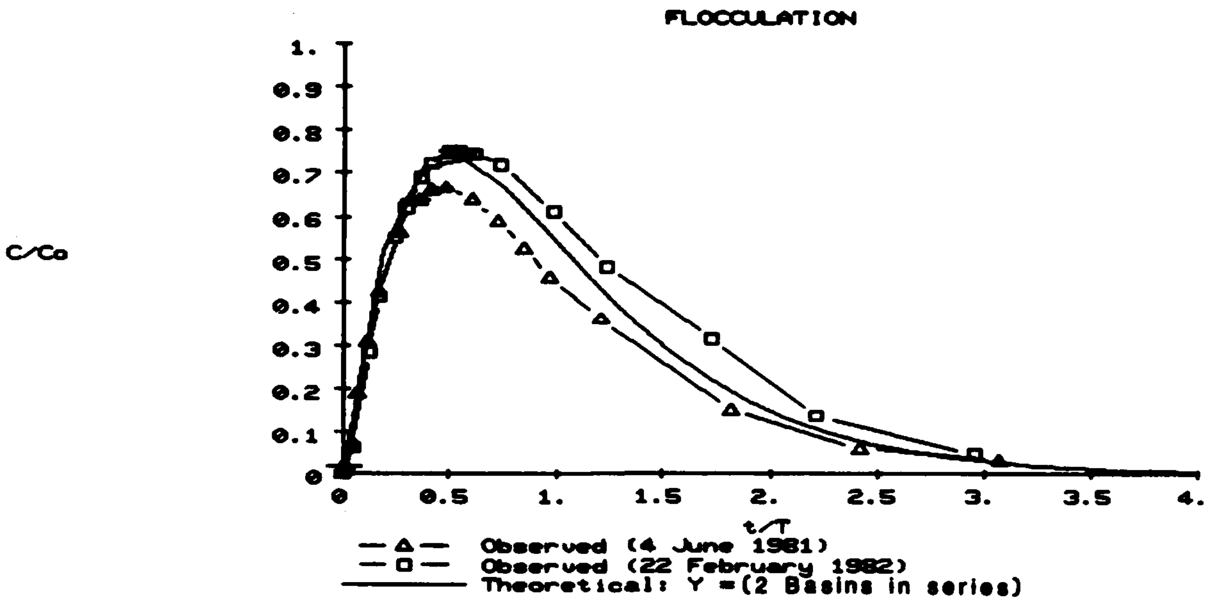
1 No physical significance is attributed to the higher than 100 percent value of ta/T and the negative value indicated for dead space. These are artifacts of a delayed response in effluent concentrations (evident in Figure I.10-6), and are probably the result of experimental error. This delay is also the source of an unusually high value for t_p/T (0.73).



RAPID MIX

HYDRAULIC CHARACTERIZATION CURVES

FIGURE I. 10-6



FLOCCULATION
HYDRAULIC CHARACTERIZATION CURVES
FIGURE I. 10-7

not subjected to the full detention time. In this respect, there are advantages to increasing the number of flocculation compartments. For the same or less total tank volume, detention time can be increased for the majority of particles. The trade-off, of course, is in increased costs for divider walls, mixers, etc. For the design as constructed at the EEWTP, the detention time for fifty percent of the particles is about eighty percent of theoretical, with some particles going through in as little as five percent of theoretical (t_i/T = 0.048). When determining Gt, the median detention time of 0.8 x 41.3 = 33 minutes should probably be used, assuming an average G value for the two basins.

Sedimentation Basin

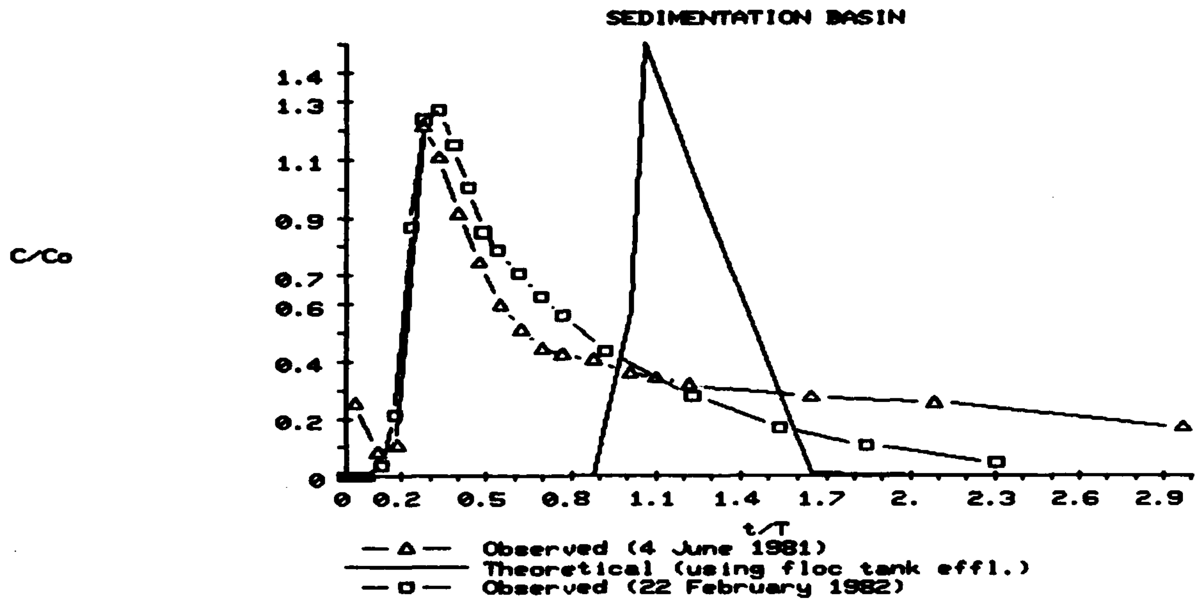
Tracer test results from both winter and late spring conditions are shown in Figure I.10-8 and clearly indicate the relatively poor hydraulic characteristics of this basin. Results from the late spring test period are summarized numerically in Table I.10-1. Short circuiting was demonstrated by a very low t_p/T value (0.23 relative to 1.0 for perfect plug flow), and nonuniform flow is indicated by a very high Morril Index (t_{90}/t_{10} = 7.1). The Morril Index is actually higher than that for two compartments of completely mixed flow. The nonuniform flow most probably indicates relatively stagnant areas through which portions of the fluid diffuse, taking much longer to pass through the basin.

The apparent short-circuiting of the sedimentation basin was probably due to temperature-induced density currents associated with afternoon warming of the surface water. Cooler influent will tend to pass as a dense undercurrent below the warmer water in the top portions of the tank. This theory correlates well with subjective operator observations of decreased performance during afternoon hours.

The portion of flow which slowly rolls through the stagnant areas helps raise the mean detention time to ninety percent of theoretical. Flocs in this flow have more chance to contact each other and increase in size. Unfortunately, the majority of flow is short-circuited with the peak fraction coming through in less than one quarter of the detention time. Over fifty percent of influent flow has left the basin within two thirds of the detention time (t_h/T = 0.67).

The poor basin characteristics obviously impair suspended solids removal. Although short circuiting is expected in all basins due to physical conditions (wind-induced, thermal, and density currents), a number of these problems may be eliminated with careful design (Kawamura, 1981).

Fortunately, in the case of the EEWTP, total sedimentation volume is sufficiently large that reasonable removals are achievable despite short-circuiting. With an overall design detention time of 4.5 hours, fifty percent of influent particles see a detention of three hours or more. Even the initial peak breakthrough of flow is subjected to a full hour of sedimentation.



SEDIMENTATION BASIN
HYDRAULIC CHARACTERIZATION CURVES
FIGURE I. 10-8

Granular Activated Carbon Columns

Using a slug of tracer applied to the influent of the lead carbon column, process effluent tracer curves were developed for the lead column as well as for the lead and lag columns in series. The carbon columns were each 17.2 feet deep and contained 8.9 feet of carbon, such that the top portion of the column was full of pressurized process water and represents an important contribution of the total contactor detention time.

For the purposes of evaluating the observed tracer curves, it is useful to consider the columns as two separate vessels: 1) a completely mixed basin in the top half of the column, and 2) plug flow through the carbon bed. If these two vessels were to behave ideally according to theory, the complete mix effluent curve associated with the first half of the column would be observed at the effluent from the column, delayed by a time equal to the carbon bed detention time.

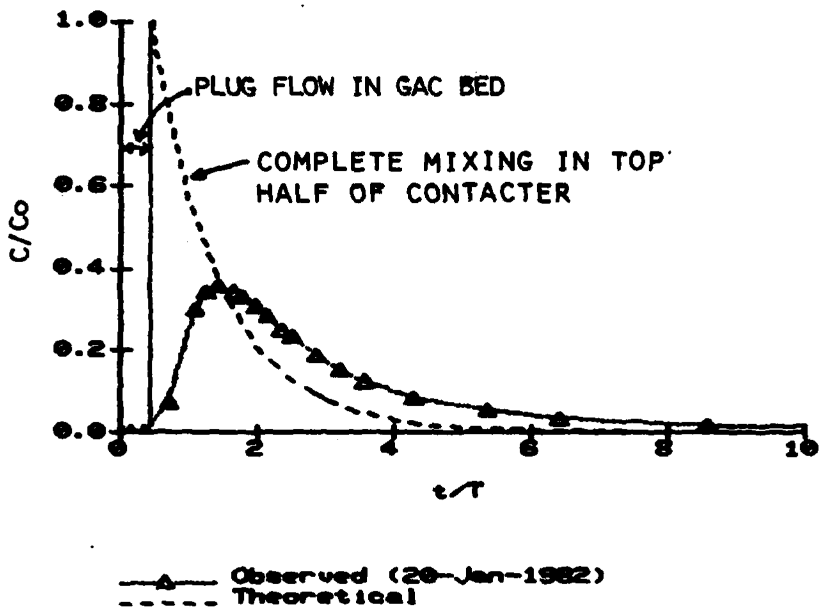
Tracer curves from the GAC hydraulic characterization were developed in this manner and are shown in Figure I.10-9. The theoretical detention time (T) and the completely mixed concentration (C_o) were computed for this figure on the basis of the top portion of the contactor only. The assumed detention time through the plug flow portion (GAC bed) is based upon an assumed void space in the carbon bed equal to 40 percent of the total volume.

The results, shown in Figure I.10-9 indicate that the assumptions of complete mixing in the top portion of the column with plug flow in the GAC bed provide a reasonably good description of the observed data.

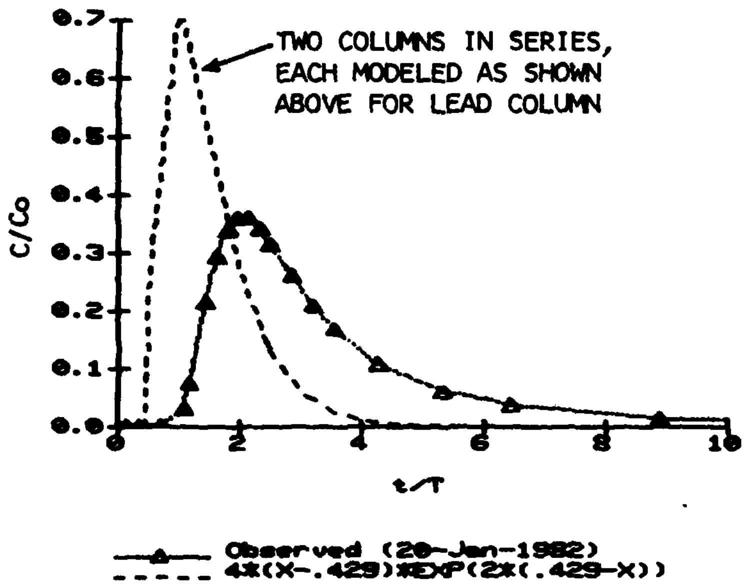
Chlorine Contact Tank

Tracer curve results for the chlorine contact tank utilized for final disinfection are provided in Figure I.10-10(a). These results were obtained in December of 1981, when the contact tank was being utilized for free chlorine contact of the full plant flow of approximately 0.5 MGD. With the given plant flow on the day of the test (345 gpm), the theoretical detection time was estimated at 55.6 minutes.

As shown in Figure I.10-10 and Table I.10-2, the median and average detention times in the contact tank were actually somewhat greater than the theoretical, with the peak concentration occurring at about 57 minutes. The average detention time (t_a), as determined from the centroid of the tracer curve, was approximately 66 minutes. It is highly unlikely that lithium was detained in the basin; thus, these results indicate that the theoretical detention time was most likely underestimated. The suspected source of error is in the calculation of flow through the basin, which involved an assumed additional flow (beyond that measured at the plant effluent) of 20 gpm for utility water consumption from the final clearwell. It is also possible that the tank dimensions were somewhat larger than indicated on the available construction drawings. Despite these apparent inconsistencies, the results do indicate reasonable plug flow, with a peak concentration at or near the designed detention time.

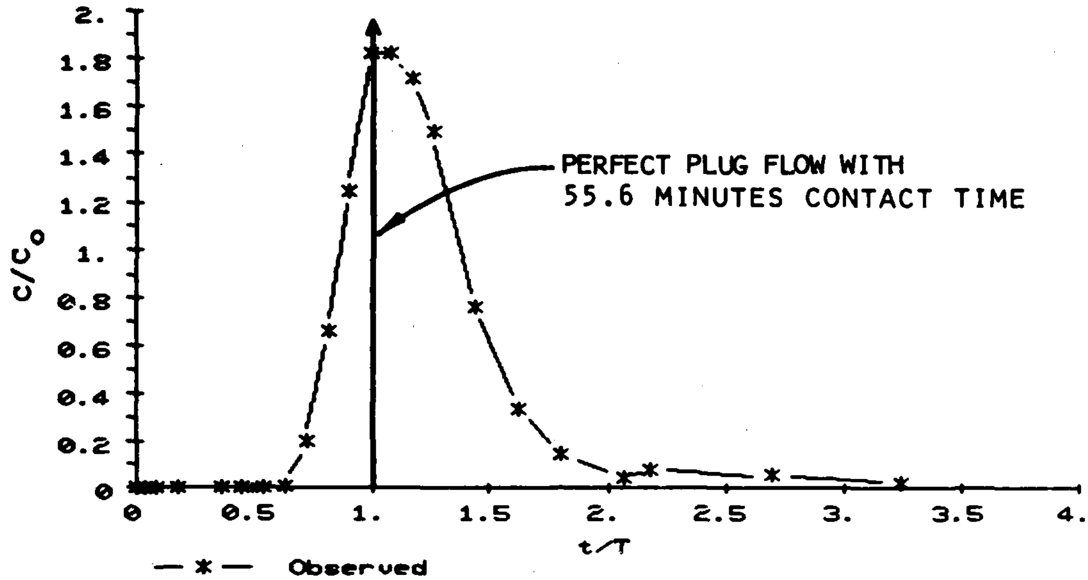


(a) Lead Carbon Column

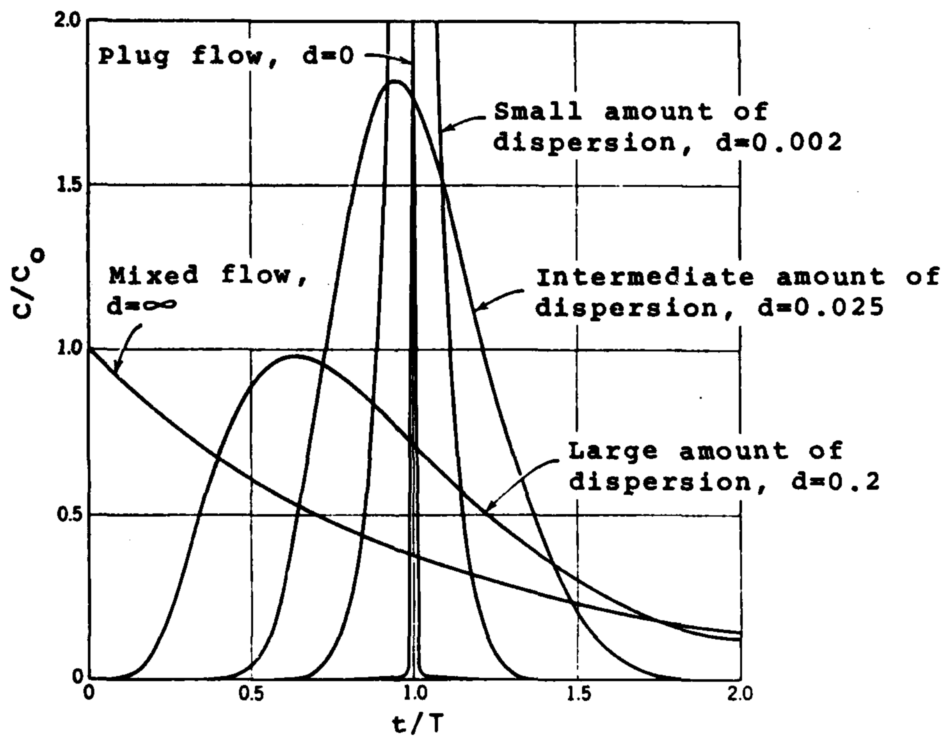


(b) Lead plus lag Carbon Columns

GRANULAR ACTIVATED CARBON COLUMNS
HYDRAULIC CHARACTERIZATION CURVES
FIGURE I. 10-9



(a) Observed tracer curve in EEWTP chlorine contact tank, d = 0.086



(b) Tracer curves in closed vessels for various extents of backmixing as predicted by the dispersion model. (from Levenspiel, 1972)

HYDRAULIC CHARACTERIZATION CURVE
CHLORINE CONTACT TANK
FIGURE I. 10-10

The bell shaped nature of the tracer curve is indicative of logitudinal dispersion and backmixing. A description of tracer curves for varying degrees of backmixing and/or logitudinal dispersion is provided by the dispersion number, d, which measures the extent of axial dispersion (Leverspiel, 1972). Theoretical tracer curves for various values of d are shown in Figure I.10-(b). A more complete description of this parameter, and of its applicability to chlorine contact design, has been provided by Trussel and Chao (1977).

TABLE I.10-2

STUDY RESULTS
CONTACT TANK

Flow Rate, l/sec (gpm):	21.8 (345)
Theoretical Detention Time (T), min:	55.6
Percent Lithium Recovered:	116%
t_i/T	0.54
t_p/T	1.03
t_{90}/t_{10}	1.88
t_n/T	1.16
t_a/T	1.19
Dispersion Number, d	0.0857

The dispersion number for the contact tank at the EEWTP was calculated from Figure I.10-10(a) to be 0.0857. According to Trussel and Chao, an assumed first-order reaction for disinfection of bacteria indicates that approximately 60 percent increase in kill is accomplished by bringing the dispersion number from 0.1 to 0.01. Thus, there is considerable improvement in potential kill which could be achieved by decreasing longitudinal dispersion below that which was observed at the EEWTP. This could potentially permit similar bacteriological disinfection with lower chlorine doses.

Calculations with assumptions of first order disinfection kinetics and assuming 99 percent kill indicate that the EEWTP contact basin may be roughly compared to a perfect plug flow contact basin with a detention time of about 43 minutes. At chlorine doses employed at the EEWTP, this contact time should be quite adequate. Thus, the hydraulic characteristics of the disinfection facility at the plant are not implicated with respect to periods of relatively poor final disinfection as discussed in Chapters 7 and 9.

Summary

The test results generally indicate that all of the mixing basins have good hydraulic characteristics, very closely reflecting what would theoretically be expected for completely mixed basins. The sedimentation basin, on the other hand, had poor hydraulic characteristics, with significant short circuiting. The

chlorine contact tank, with its serpentine flow configuration, showed no significant short circuiting, although there was a moderate amount of longitudinal dispersion and back mixing.

MICROSCREENS

DESCRIPTION OF UNITS

Microscreening was the first unit process at the EEWTP. Two microscreens were installed at the plant, designed for parallel operation. Piping was such that either the entire blended flow could be directed through one microscreen, or the individual (unblended) source waters could be applied separately to each screen. The majority of operation was in the first mode.

Design Criteria

The original objective of the microscreens, as outlined in the Design Memorandum (Malcolm Pirnie, 1976) was as follows:

> "Removal of suspended materials, including organic detritus, soil particles, and various microorganisms including algae. Removal of other constituents such as heavy metals and viruses, associated with the suspended material, could be significant."

The two microscreens at the EEWTP were identical units, manufactured by Lyco-ZF. The units were continually backwashed, rotating drum screens operating under gravity flow. The filtering fabric consisted of Tetko, Inc. "PeCap" monofilament polyester screens with 35 micron (.0014 inch) mesh openings. Total open area of the screens was about 17 percent. Twenty panels of screens were fitted to the periphery of the rotating drum in each microscreen.

Influent water entered the open end of the drum and flowed outward through the openings in the screening fabric. The collected solids were backwashed from the interior surface of the rotating drum by high pressure jets into a trough located within and at the highest point in the drum. The 28 gpm of wash water containing the solids was conveyed to the backwash holding tank. Algae and bacterial growth on the screens was minimized by means of an ultraviolet light at the top of the unit. Each drum was 5.2 ft in diameter and 4.4 ft long with 71.7 ft^2 of fabric area. The drums had a minimum of 66 percent of their area submerged for a loading rate of 7.3 gpm/ft^2 (assuming 0.5 MGD through one screen).

Design criteria for these units set the peripheral drum speed between 5 and 150 ft/min (0.9 and 9.2 rev/min) with a maximum headloss through the filters of 6 inches. Drum speed was variable and was designed to be automatically controlled to maintain flow through the unit at a constant differential pressure.

OPERATIONAL HISTORY

The microscreening process was employed during the first four months of operation at the EEWTP. With the exception of short periods during which one of the two influent sources was out of service or the microscreens were temporarily by-passed for maintenance, the blended mixture of nitrified effluent and estuary water was processed through a single microscreen. For the first nine days of operation, microscreen no. 1 was utilized. For the remainder of the first four months, microscreen No. 2 was in use. A summary of operation is provided in Table I.10-3.

TABLE I.10-3

MICROSCREEN OPERATIONAL SUMMARY

	Days of Operation, 18 March-18 July 1981			
	Nitrified Effluent Only	Estuary Water Only	Blended Source Water	Total
M.S. #1	0	0	8.9	8.9
M.S. #2	5.3	7.2	95.3	107.8
Both Microscreens O.S.	0	0.1	8.5	8.6
				125.3

In order to compare treatment with and without microscreening, the screens were taken out of service for an extended period, beginning 18 July 1981 (coinciding with an operational shutdown for maintenance). The screens were placed back in service on 29 August 1981.

Operation

Operationally, the microscreens required relatively little attention. Microscreen speed was controlled off of differential level through the screen, such that, when operating properly, no manual adjustments were required. In this case, the only operational manpower required was to routinely (every two hours) check the operating speed and water levels, as part of the operator's routine rounds.

One operational problem was a failing of the power control board, such that automatic speed control was not achieved. In this case the operators had to spend an additional ten to fifteen minutes each shift to manually adjust the screen speed to achieve the desired influent water level. The majority of operation was in this manual mode.

Of more concern were problems with failing of the tachometer generator, which tightened up and ceased to produce speed read-out or control signals on several occasions. Failing of this unit on one microscreen occurred during start-up and the generator was sent back to the manufacturer for repair. Operation through

18 July was with the other tach generator, which also finally failed. As of 1 October 1981, neither tachometer generator was functional and drum speed could not be directly monitored. Adjustments in speed could be made only through adjustments to a potentiometer inside the control panel.

With operation of the microscreens, particular attention had to be paid to level control during times of plant flow surges (influent pump shut down or start-up). On these occasions influent level occasionally backed up to overflow, sometimes flooding through the backwash water discharge system, which had to be opened to atmosphere for flow gauging. In these cases, the microscreens had to be manually by-passed until flow stabilized.

One interesting operational problem developed in early September. Quantities of tiny clam shells which came in with the estuary water clogged the microscreens and caused flooding and by-pass of the units. The shells presumably accumulate at the estuary intake structure or, possibly, in the pipe itself, and became dislodged with surges in flow, outside agitation, or natural die off.

In terms of operational control, the only measurements of interest for the microscreens were drum speed and differential level. These are shown in Table I.10-4 for the first four months of operation.

TABLE I.10-4

OPERATIONAL SUMMARY
MICROSCREENS
16 MARCH - 18 JULY 1981

Drum Speed, indicated rpm	
Range	3.4 - 9.0
Mean	5.1
Differential Level, inches	
Range	0.0 - 3.3
Mean	0.9

Maintenance

Routine maintenance of the microscreens involved greasing the reducer bearings monthly, changing reducer oil quarterly, and running calibration checks on the instrumentation every one to two months. These routine tasks amounted to only about eight man-hours/month.

In addition to routine maintenance, repair of the following two items were frequent maintenanace requirements: 1) malfunction of tachometer generators and/or of the power control boards; and 2) ripping of individual polyester screens. These two items accounted for virtually all microscreen down time (seven percent) during the first four months of operation. The problem with failure of

the tachometer generators has been previously discussed. The problem with the screens ripping is one which was most prevalent during the first month of start-up. The polyester screens tended to become brittle if left dry or with sludge in the pores when not in use. Over twenty screens were torn during the course of start-up. These were discovered after the first week of operation, at which time, the spare screens and screens from both units had to be pooled to obtain twenty usable screens to keep one unit in operation.

Another major maintenance problem with the microscreens occured during the extended shutdown in August. At that time, the babbit bearing on the drum of microscreen No. 2 siezed. The problem was attributable to the accumulation of sand, grit, and rust in the unit, which was without water lubrication while idle. The bearing required considerable labor (over 100 man-hours) to free and remove. This problem should not occur in a continually operating unit.

PERFORMANCE EVALUATION

General Performance

Turbidity and Solids Analysis. Table I.10-5 provides an analytical summary of turbidity and solids results around the microscreens for the first four months of operation at the EEWTP. It can be seen that, over approximately 104 days of operation on blended effluent, the removal of turbidity and suspended solids were, on the average, 13 and 17 percent, respectively. These values are based on 24-hour composite samples of the individual source waters and of the blended microscreen effluent.

PSD Analyses. Particle size distribution analyses were periodically conducted on grab samples of microscreen influent and effluent as part of the TPPAM. Results of eight analyses, conducted between 31 May and 15 July 1981, are presented in Table I.10-6. Average size distribution plot and a typical removal vs. size bar graph are presented in Figures I.10-11 and I.10-12, respectively.

The results indicate that the microscreen is effective in removing particles greater than 35 µm, as would be expected. In addition, the total particle count and beta[2] values indicate that some of the larger particles may have been broken down through the microscreens and/or blend mixing. It is impossible to differentiate between these processes with available data, but it is likely that some shearing occurred through each process.

2. The beta value of a particle size distribution represents the slope of a plot such as that shown in Figure 7-9. When beta=1, the particulates are distributed equally in each of the class intervals. The higher the beta value, the more the concentration is dominated by finer particles. For a hypothetical suspension of particles in the measurable range 0.5 to 100 µm, total surface area concentration of the particulate fraction resides predominantly in the fractions below 10 µm at any beta>3. (This assumes that particle shape is independent of size.) For a more in-depth discussion of beta factors, the reader is referred to Particulates in Water, M. C. Kavanaugh and J. O. Leckie, ed., American Chemical Society, Washington, D.C. 198\

TABLE I.10-5

MICROSCREENS INFLUENT AND EFFLUENT, TSS AND TURBIDITY DURING OPERATION ON BLENDED INFLUENT 16 MARCH - 18 JULY 1981

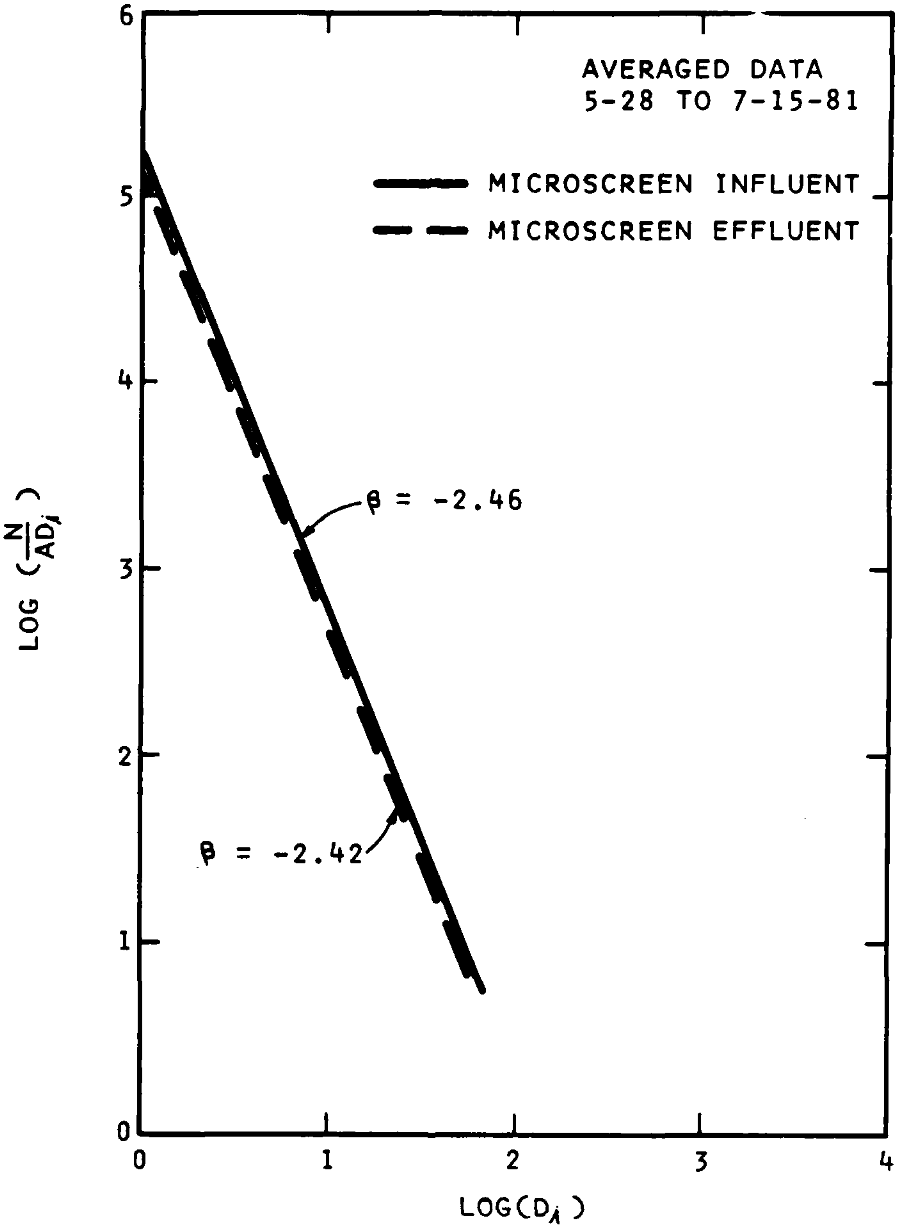
	Plant[1] Influent	Blend Tank Effluent
Turbidity, NTU		
No. of Sample Pairs	94	94
Arithmetic Mean	15	13
Std. Dev (±)	5.8	5.7
Median	15	12
90% Less Than	19	18
Range	7.2 - 47	4.4 - 50
Total Suspended Solids, mg/L		
No. of Sample Pairs	67	67
Arithmetic Mean	18.5	15.4
Std. Dev (±)	8.3	8.1
Median	17.5	14.0
90% Less Than	26.4	24.0
Range	7.0 - 62.3	5.0 - 52.0

1 Flow weighted "average" from daily composite analyses on two source waters. Note: Turbidity is not a parameter for which arithmetic averaging between samples is necessarily valid. However, comparative data of influents and blend water, with the microscreens off-line, indicates that averaged results are representative of the blended water to within ±5% (average of 38 data points).

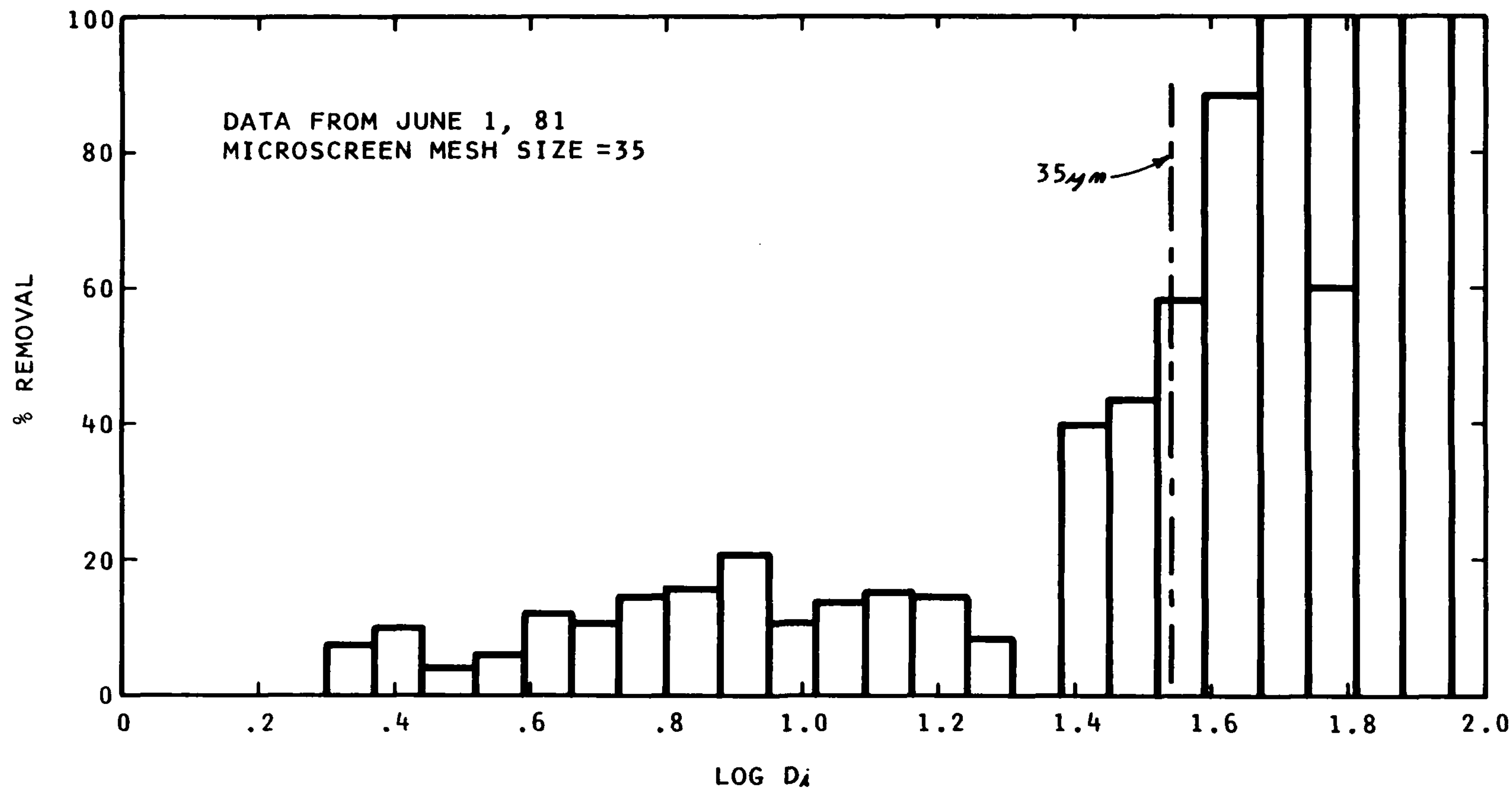
TABLE I.10-6

MICROSCREENS INFLUENT AND EFFLUENT PARTICLE SIZE DISTRIBUTION DATA

	Influent	Blend Tank Effluent
No. of Sample Pairs	8	8
Total Counts (No./ml)		
Arithmetic Mean	37,400	37,100
Std. Dev. (±)	9,060	9,460
Min.	25,000	23,000
Max.	50,400	51,000
Mean Particle Diameter Based on Population, d_N (µm)		
Arithmetic Mean	5.7	5.6
Std. Dev. (±)	0.6	0.6
Min.	5.1	5.0
Max.	6.6	6.9
Mean Particle Diameter Based on Volume, d_V (µm)		
Arithmetic Mean	32.6	25.6
Std. Dev. (±)	4.4	5.0
Min.	26.1	21.5
Max.	41.7	36.6
Beta Value		
Arithmetic Mean	-2.46	-2.42
Std. Dev. (±)	.18	.14
Min.	-2.13	-2.15
Max.	-2.66	-2.58



MICROSCREEN INFLUENT
AND EFFLUENT β VALUES
FIGURE I. 10-11



PARTICULATE REMOVAL-MICROSCREEN
FIGURE I. 10-12

Asbestos Removal. As part of the initial RWQTP, asbestos fibers were examined in 7-day composites from five points in the plant. Table I.10-7 presents relevant asbestos results. Table I.10-8 shows removal statistics for eleven weeks during which the microscreens were operating and for which paired samples are available.

The data indicates that, on the average, some asbestos fibers were removed by the microscreens. Because of the nature of the analysis, however, results are highly variable with apparent negative removal rates on some days. Observed asbestos removals were undoubtedly due to removal of asbestos harbored in larger particles. Although it is difficult to draw specific conclusions from the results, it appears that asbestos removal through the screens was unreliable and generally far from complete.

TABLE I.10-7

SUMMARY OF ASBESTOS ANALYSES

	No. of Chrystotile Fibers MFL		
End of Week (For 7 Day Composite)	Blue Plains Nit. Effl.	Potomac Estuary	Blend
3/31/81	3.90	7.29	ND
4/08/81	1.84	19.68	0.66
4/15/81	2.60	14.70	5.70
4/22/81	1.38	---	9.20
4/29/81	14.40	1.30	---
5/06/81	ND	26.20	6.56
5/13/81	2.62	3.94	ND
5/20/81	1.31	2.67	4.60
5/27/81	1.31	8.75	0.33
6/03/81	---	5.47	ND
6/10/81	0.96	19.48	ND
6/17/81	0.67	3.73	3.94
6/24/81	0.29	8.87	3.30
7/01/81	ND	5.13	ND
7/08/81	---	0.99	48.55
7/15/81	2.95	2.73	4.59
No. of Samples/No. Used for Statistics[1]	14/12	15/15	15/10
Arith. Mean $\pm$ Std. Dev.	1.31$\pm$3.90	8.73$\pm$7.47	8.74$\pm$13.50
Geom.Mean/$\overline{\text{S.F.}}$[2]	2.85/3.62	5.85/2.57	3.98/3.66
Median/90%	1.31/3.90	5.47/19.68	3.30 -9.20

1. Samples not detected (ND) are not used for statistics.
2. S. F. = Spread Factor

TABLE I.10-8

SUMMARY OF ASBESTOS REMOVAL THROUGH MICROSCREENS

	Combined[1] Influent	Blend Tank	% Removal
3/31/81	5.56	ND[2]	100
4/08/81	16.83	0.66	96
4/15/81	8.47	5.70	33
5/06/81	12.86	6.56	49
5/20/81	2.02	4.60	-128
5/27/81	5.05	0.33	93
6/10/81	5.26	ND[2]	100
6/17/81	1.85	3.94	-113
6/24/81	4.50	3.30	27
7/01/81	2.50	ND[2]	100
7/15/81	2.85	4.59	-61
No. of Sample Pairs	11	11	11
Arith. Mean ± Std. Dev.	6.16 ± 4.57	2.69 ±2.42	47% ± 78%
Geom. Mean/S.F.[3]	4.82/2.00	NA[2]	- - -
Median/90%	5.05/12.86	3.30/5.70	- - -

1. Combined influent is calculated from Table I.10-7 on the basis of average flows from each source for the week in question.
2. Values "not detected" are assumed to be 0 for the calculations in this table. Geometric mean is therefore meaningless.
3. S.F. = Spread Factor

TOC Removal. Under the initial RWQTP, TOC was not a parameter which was routinely evaluated prior to the blended plant influent. For this reason, a special study was conducted on microscreen influent and effluent water. This study, conducted during the week of 23 June through 29 June consisted of daily compositing of two hour grab samples from each location. Turbidities were measured on each grab sample and each composite sample was analyzed for TOC and particle size distribution. The results, in terms of arithmetic mean value ± standard deviation, are presented in Table I.10-9.

TABLE I.10-9

COMPOSITE TESTING PROGRAM
ANALYTICAL SUMMARY
ARITHMETIC MEANS ± STANDARD DEVIATIONS

	Influent	Effluent
Number of 24-hour composites:	7	7
Turbidity, NTU	16.3 ± 3.8	14.7 ± 3.5
TOC, mg/L	4.61 ± 0.19	4.12 ± 0.22
Number of Composites Used for PSD Analysis	4	4
Total Particle Count, #/ml	37,500 ±4,500	36,200 ± 5,700
Mean Particle Diameter (Population), µm	6.4 ± 0.6	6.2 ± 0.5
Mean Particle Diameter (Volume), µm	44.3 ± 4.5	42.0 ± 6.9
Beta Value	2.32	2.33

Thus, about 11 percent of influent TOC was removed by the microscreens during the test period. The TOC removed was most probably in particulate form.

Particle size distributions of the composited samples were determined for four days of the testing period, as indicated in Table I.10-9. The data indicates a total particle count typical of that found in the grab samples, although mean particle size, particularly with respect to volume, was much higher in the composited samples. This variation is most likely due to coagulation during the 24-hour composite period, such that little significance can be placed on specific size data from the composite samples. The data does serve as a qualitative illustration that the TOC removal was associated with a reduction in mean particle size and, thus, with removal of the larger sized particles.

Comparative Study

A more useful measure of the effect of microscreen operation on overall plant performance is provided by comparing performance during operational periods with and without the microscreens on-line. Data from operation under comparable plant operating conditions were utilized for this evaluation; adjacent time periods of equal duration were selected to minimize any possible effects of seasonal variation in plant influent characteristics. Table I.10-10 presents average suspended solids data and cumulative removals using daily composites taken during the two study periods.

TABLE I.10-10

PROCESS PERFORMANCE FOR
TOTAL SUSPENDED SOLIDS WITH AND WITHOUT MICROSCREENING[1]

	Suspended Solids, mg/L		Cumulative Percent Removal	
	MS On-Line	MS Out of Service	MS On-line	MS O/S
No. of Composite Samples	20	20		
Influent[2]	14.1±4.6	12.8±3.8	0	—
Blend Tank (Microscreen effluent)	12.6±4.1	12.3±4.5	11	0
Sedimentation Effluent	4.0±1.6	2.9±1.4	72	76
Filter Effluent	ND	ND	100	100

1. Based on arithmetic means and standard deviations at process sites.
2. Flow weighted average from analyses on two source waters.

It can be seen that the combined removal of microscreening and sedimentation accounted for removal of over seventy percent of the influent suspended solids in both cases. Although the microscreens were effective in removing about eleven percent of the influent solids, these were apparently solids which are readily removed by sedimentation without microscreening. This is not surprising, as the particles removed by microscreening were generally large (greater than 35 μm, see Figure I.10-12), and should have settled out readily. There is some evidence that these larger particles may have actually enhanced the overall sedimentation process, and that their prescreening was detrimental to coagulation.

Turbidity. Table I.10-11 presents average turbidity results from the two study periods.

TABLE I.10-11

PROCESS PERFORMANCE FOR
TURBIDITY REMOVAL WITH AND WITHOUT MICROSCREENING

	Turbidity, NTU	
	Microscreen On-Line	Microscreens Out of Service
No. of Days Evaluated	26	26
Influent[1]	13.7±4.1	10.7±2.7
Blend Tank[2]	11.8±4.0	10.1±2.5
Filter Influent[3]	2.6±0.4	2.0±0.3
Filter Effluent[3]	0.19±0.07	0.14±0.06
No. of Filter Runs	21	18
Average Filter Run Length, hrs.	72.5	67.3
Average Filter Headloss at Backwash, ft.	6.6	5.8

1. Flow weighted "average" from daily composite analyses on two source waters.
2. From daily composites.
3. From two hour ODCS measurements. (Standard deviations represent deviations of the daily averages.)

As with the suspended solids, the turbidity removal through sedimentation did not deteriorate with the microscreens off-line. The filtration process was relatively unaffected, as well.

The longer average filter run length with the microscreens on-line was the result of four extremely long runs (two on each filter) during the week of 22 June 1981. The average run length for the remaining 17 filter runs was 63.9 hours, with an average headloss at backwash of six feet.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

While operating generally within the original design expectations, the microscreens did not show any appreciable contribution to plant performance. The suspended matter which was removed was relatively large and, together with associated contaminants, was easily removed through settling alone. It was also demonstrated that the downstream filtration process was virtually unaffected by taking the microscreens out of service.

Removal of algae from the estuarine source was presumably the primary design function of the microscreens. However, influent algae levels were low during the entire period of operation and removal could not be evaluated at the EEWTP.

Moreover, it is unlikely that the 35 μm mesh of the microscreens could remove smaller algae, and would be potentially effective only for removal of larger diatoms and filamentous blue-green algae.

Operational requirements of the microscreens were, in general, relatively low, although power requirements were significant. Pumping to the microscreen influent required an additional five to six feet of head relative to direct pumping to the blend tank.

Maintenance requirements for the microscreens were significant, although a major portion of the labor was required for resolution of problems associated with periods of disuse. This merits concern with respect to microscreen consideration for any full-scale application not requiring continuous operation.

Recommendations

On the basis of information obtained, the initial investment and operational expenses of microscreens would not be recommended at a full-scale plant. Essentially, the units showed little benefit over treatment through sedimentation without pre-screening.

The only potential benefit of microscreens is through the screening of algae, particularly blue-greens. It is not evident that such algae would necessarily be present in the estuarine source under drought conditions, although the potential exists. In any event, operation at the EEWTP could not model this condition, and no useful information could be obtained through the microscreen operation.

In light of the above, the microscreens were taken out of service at the EEWTP as of October 1981. This allowed a more extensive study of the effect of untreated influent on downstream processes and was more representative of the likely process combination for the full-scale plant.

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APPENDIX J

ADDITIONAL ORGANICS ANALYTICAL PROGRAM

BACKGROUND

The RWQTP trace organics monitoring included a number of analyses to assess levels of organic contaminants in the sub-microgram per liter range. In spite of these modern analytical techniques employed in the RWQTP, it was not capable of detecting all organic chemicals present in the samples. The RWQTP methodologies relied primarily on gas chromatography or combined gas chromatography-mass spectrometry (GC/MS) for the separation and identification of organics. Preconcentration steps were usually required in order to obtain sufficient quantities of material for detection by the instrument systems.

For the RWQTP, the application of techniques such as dynamic gas-stripping and solvent extraction permitted the isolation of only a limited number of organic compounds from aqueous solution. For example, ionic species and highly polar neutral organic compounds often escape detection by these techniques due to their high aqueous solubility and low volatility. Also, heavier molecular weight materials isolated by some of the procedures were too non-volatile to be analyzed by the GC and GC/MS procedures utilized.

In an attempt to expand the range of organics analyses, an Additional Organics Analytical Program (AOAP) was initiated, to complement the organics monitoring in the RWQTP. The AOAP was limited in scope due to budget and time constraints. Many of the techniques initially selected for inclusion in the survey were dropped because they involved considerable analytical research and development costs. In spite of this constraint, several unique analytical techniques were employed to provide lower detection limits or for detection of compounds not included in the primary and secondary organic compounds found through the RWQTP.

The text which follows describes six additional analytical procedures which were employed, their significance, and the results of tests conducted on a few project samples. The procedures which were utilized are:

- Modified Liquid/Liquid Extraction for Dihaloacetonitriles
- High Performance Liquid Chromatography (HPLC)
- Steam Distillation
- High Resolution GC/MS
- Cation Exchange
- Anion Exchange

SAMPLING AND PRESERVATION

All AOAP samples were grabs collected at three EEWTP sampling locations, the blended influent, final carbon column effluent and finished water, and finished water from the three local MWA water treatment plants (WTP) monitored in the RWQTP. If necessary, samples were preserved on-site and shipped in coolers to the project off-site laboratory for analysis. Coolers arrived off-site after overnight shipment.

The AOAP was initiated and concluded during Phase IIA operation of the EEWTP.

MODIFIED LIQUID/LIQUID EXTRACTION (DIHALOACETONITRILES)

Dihaloacetonitriles (DHAN) are a class of compounds formed in water by the reaction of chlorine with amino acids and certain naturally occuring organic compounds (Oliver, 1983; Keith et al, 1981, McKinney, et al, 1976). They have been shown to be byproducts of the chlorination of drinking water (Trehy, 1980) and are probably present in most water supplies using free chlorine for disinfection. Although an incremental lifetime cancer risk for DHAN's has not yet been calculated, they have been shown to have mutagenic and carcinogenic effects (Bull, 1980).

The DHAN compounds most commonly found are:

Dichloroacetonitrile (DCAN)
Chlorodibromoacetonitrile (CBAN)
Dibromoacetonitrile (DBAN)

PROCEDURE

The analysis of DHANs consisted of a pentane extraction followed by GC/ECD analysis. Each sample was collected headspace-free in a 125 ml amber glass bottle which had a teflon-lined (TFE) septum. The samples were kept at 4°C until extraction. The samples were extracted immediately upon arrival at the off-site laboratory, usually about 24 hours after the samples were taken. For extraction, 15 ml of a sample was withdrawn and discarded. Sodium sulfate (30 gm) was added to the sample, followed by 5 ml of pentane. The sodium sulfate was added to decrease the solubility of the DHANs in water, thereby increasing the efficiency of their extraction into pentane. The pentane contained 1,2-Dibromopropane as an internal standard (1725 µg/L in pentane; equivalent to a concentration of 75 µg/L in water). After the samples were shaken on a rotary platform shaker for twenty minutes, the sample bottles were opened and the pentane extract was transferred into two, 2 ml autosampler vials. Each vial was sealed with a TFE septa and screw cap. One of the vials was analyzed immediately on a Varian 6000 GC and the other was saved as a backup sample. The samples were analyzed by GC/ECD as soon as possible after extraction. The sample extracts were placed in the Varian autosampler along with the appropriate standards and blanks.

GC conditions:

Injection volume:	2 µl split injection
Carrier Gas:	Ultrapure Nitrogen @ 80 psi
Injector pressure:	12 psi
Split flow:	30 ml/min
Make-up flow:	30 mg/min
Column flow:	1 ml/min
Injector temperature:	220°C
Detector temperature:	350°C
Column temperature:	40°C for 3 minutes, then programmed to 60°C at 10°C/min., held at 60°C for 5 minutes

The quantitation was done by the internal standard technique. The concentration of Dichloroacetonitrile was 1/10 the concentration of the other two DHAN's because the technique was observed to be more sensitive to the dichloroisomer. Each day, calibration curves were analyzed at Dichloroacetonitrile concentrations of 0.5, 1.0, 5.0, 10, and 50 µg/L. Extraction and system blanks were run approximately every nine samples.

PRECISION

The precision tests were done in deionized water at a concentration of 0.5 µg/L DCAN and 5 µg/L CBAN and DBAN.

Replicate	DCAN	CBAN	DBAN
1	0.48	4.74	4.67
2	0.45	4.68	4.83
3	0.48	4.89	4.84
4	0.49	5.14	5.15
5	0.47	4.93	4.82
6	0.52	5.35	5.30
7	0.51	5.31	5.19
Average	0.49	5.01	4.97
Std Deviation	0.02	0.23	0.24
True Value	0.50	5.00	5.00
IDL[1]	0.05	0.5	0.5
MDL[2]	0.06	0.7	0.8

1. IDL = Instrument Detection Limit or two times the background noise of the instrument.
2. MDL = Method Detection Limit or three times the standard deviation of the seven replicates.

RESULTS

Twelve samples were analyzed for DHANs taken at six sites on two different days. The sites analyzed were the EEWTP blended influent, final carbon column effluent, EEWTP finished water, and the finished waters from the three local WTPs. DHANs were not found in the influent to the EEWTP. After the addition of chloramines to ozone disinfected GAC effluent, the DHAN concentration was observed to be 0.08 µg/L, close to the MDL, in one sample. Also shown in these tables are the levels of THMs found in samples taken on the same day or proximate days. As shown, the distribution of DHANs followed the same pattern as for THMs. The predominant specie was the DCAN, analagous to $CHCl_3$ in the THM group. Also, the ratio of DCAN to $CHCl_3$ in the finished waters of the local plants ranged from 8.9 to 10.4 on a mass basis. These results are similar to those repc.ted by Oliver (1983).

In the case of the EEWTP in Phase IIA, no free chlorine was present in the treatment train, and thus, only trace levels of DHANs were found.

EEWTP SITES (µg/L)

Compound/Date	Blended Influent	Final Carbon Column Effluent	Finished
7/26/82			
DCAN	ND[a]	ND	0.08
CBAN	ND	ND	ND
DBAN	ND	ND	ND
CHCl3	2.4	ND	0.2[b]
DCBM	0.8	ND	0.2[b]
DCBM	0.4	ND	0.3[b]
CHBr3	ND	ND	0.3[b]
7/27/82			
DCAN	ND	ND	ND
CBAN	ND	ND	ND
DBAN	ND	ND	ND

a. ND = Not Detected.
b. Data from 7/29 RWQTP composite LLE samples.

FINISHED WATERS (µg/L)

Compound/Date	EEWTP	WTP1	WTP2	WTP3
7/26/82				
DCAN	0.08	9.6	11	4.1
CBAN	ND[a]	1.7	0.5	0.8
DBAN	ND	ND	ND	ND
CHC13	0.2[b]	85	115[c]	38
DCBM	0.2[b]	16	8.2[c]	11
DCBM	0.3[b]	2.4	0.4[c]	2.1
CHBr3	0.3[b]	ND	ND	ND
7/27/82				
DCAN	ND	9.9	11	5.0
CBAN	ND	1.7	0.63	1.2
DBAN	ND	ND	ND	ND

a. ND = Not Detected.
b. Data from 7/29 RWQTP samples
c. Data from 7/25 RWQTP samples

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) HIGH MOLECULAR WEIGHT FRACTION

This procedure was used for the analysis of nonvolatile, high molecular weight organic compounds. It is a highly sensitive technique for measuring a variety of compounds, such as the Polynuclear Aromatic Hydrocarbons (PAH), naphthalene, benzo(a)pyrene, and anthracene (Krstulovic, 1976; Wilkinson, 1979, Ogan, 1978; Ogan, 1979; Sorrell, 1979; Grant, 1977; Thruston, 1978; Ogan, 1980). Many of these compounds are suspected human carcinogens. The EPA has estimated a level of 0.97 µg/L for PAH to correspond to the one per million incremental lifetime cancer risk. The HPLC method is capable of quantifying many PAH compounds down to the nanogram per liter level. Some of the PAH compounds were observed in the regular monitoring of the RWQTP. The HPLC method provides a more precise and comprehensive assessment of these compounds in samples, because the analytical noise level is reduced. The analysis of the sample extracts was performed by High Performance Liquid Chromatograph (HPLC) because of the low volatility and excellent fluorescent response of the polynuclear aromatic compounds being studied. The compounds determined were:

Naphthalene
2-Chloronaphthalene
Fluorene
Phenanthrene
Anthracene

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- Fluoranthene
- Pyrene
- Benzo(a)anthracene
- Chrysene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzo(a)pyrene
- Dibenzo(a,h)anthracene
- Benzo(g,h,i)perylene
- Ideno(1,2,3-c,d)pyrene
- Coronene

PROCEDURE

The methylene chloride extraction technique was used to detect the aromatic hydrocarbons from the size of naphthalene up to coronene. A reverse phase C-18 column was used to separate the compounds and the fluorescence detector used for maximum sensitivity.

Grab samples were collected in 1 L amber glass bottles with teflon-lined caps. The samples were dechlorinated with sodium sulfite and acidified to pH 2 to prevent biological degradation. The samples were stored at 4°C until analysis. For the extractions, 500 ml of the sample was placed into a one liter separatory funnel. The pH was adjusted to pH 7 by the addition of sodium hydroxide. Next, 30 ml of pesticide grade methylene chloride was added to the separatory funnel and the sample shaken for two minutes. The organic layer was allowed to separate and was poured into an Erylenmeyer flask. This was repeated a second and a third time in the same manner. The extracts were combined in a 250 ml round bottom flask and one gram of anhydrous magnesium sulfate added. The sample was allowed to sit for fifteen minutes and the magnesium sulfate removed by gravity filtration. The residual magnesium sulfate was then rinsed with 30 ml of methylene chloride. The filtered extract was then placed in a 500 ml Kuderna Danish (KD) equipped with a 10 ml concentrator tube. The sample was evaporated to 1 ml by placing the concentrator tube in a 60-65°C water bath.

The methylene chloride extract was then cleaned-up by passing it through a silica gel column. The column consisted of 10 gm of silica gel which had been washed in pentane. The extract was placed on the top of the column and the compounds eluted from the column with 25 ml of pentane followed by 40 ml of 40% methylene chloride in pentane (v/v). The methylene chloride eluant contained the compounds of interest. This was then reduced to dryness under a flow of nitrogen at 40°C. The residue was then redissolved in 1 ml of acetonitrile and stored in an amber glass vial with a TFE liner. The samples were analyzed as soon as possible by HPLC.

The sample was injected into a Varian Model 54 HPLC equipped with a Perkin-Elmer 10 µm, 0.26x25cm HC-ODS C-18 reverse phase column. The HPLC conditions were as follows:

Injection volume:	10 µl
Column used:	10 µm, C-18 reverse phase
Column temperature:	25°C
Column flow rate:	1.0 ml/min
Absorbance detector	
#1 wavelength:	254 nm
#2 wavelength:	300 nm
Fluorescence detector excitation wavelength:	220 nm
Fluorescense detector emmission wavelength:	530 nm
Solvent program:	40% Acetonitrile in water for 5 minutes then programmed to 100% Acetonitrile in 25 minutes. Column was then rinsed in Methanol at 5 ml/min for 15 minutes prior to the next injection

The peaks were identified both by retention time and by the absorbance ratios. The absorbance ratio was the ratio of the absorbance at 254 nm and at 300 nm. In addition, the ratio of the fluoresence divided by the absorbance at 254 nm was determined. These ratios were determined for standards which were run and then used to aid in the identification of the peaks in the samples. The compounds were quantified using the external standard method. A standard at 5 µg/L was extracted along with the samples and this was used for the quantitation. In addition, a water blank was extracted and run as a sample.

PRECISION

Precision data were obtained to compute the IDL and MDL. The IDL was the instrument detection limit, or the lowest concentration which could be seen on the instrument. The MDL was the method detection limit, or three times the standard deviation of a set of seven replicates. The MDL is the lowest concentration which can be accurately quantitated.

Compound	IDL (ng/L)	MDL (ng/L)
Naphthalene	3.75	25
2-Chloronaphthalene	33	20
Fluorene	9.5	24
Phenanthrene	4.5	7.5
Anthracene	0.5	3.0
Fluoranthene	0.5	3.5
Pyrene	1.0	1.5
Benzo(a)anthracene	0.5	1.0
Chrysene	0.5	1.0
Benzo(b)fluoranthene	2.5	3.5

Benzo(k)fluoranthene	0.5	1.0
Benzo(a)pyrene	0.5	1.0
Dibenzo(a,h)anthracene	2.5	3.5
Benzo(g,h,i)perylene	2.5	3.5
Indeno(1,2,3-c,d)pyrene	0.5	1.0
Coronene	2.5	34

RESULTS

Twelve samples were analyzed by HPLC, at six sites on two different days. The sites analyzed were the EEWTP blended influent, final carbon column effluent, EEWTP finished water, and the finished waters from the three local WTPs. From the number of samples collected it is difficult to assess the EEWTP performance. Low concentrations of PAHs were found in all the finished waters. The results were as follows:

EEWTP SITES (ng/L)
(Single Samples)

Compound/Date	Blended Influent	Final Carbon Column Effluent	Finished
8/23/82			
Indeno(1,2,3-c,d)pyrene	8.9	3.3	4.4
Naphthalene	ND	58	ND
9/21/82			
Indeno(1,2,3-c,d)pyrene	11	ND	9.1

FINISHED WATERS (ng/L)
(Single Samples)

Compound/Date	EEWTP	WTP1	WTP2	WTP3
8/23/82				
Indeno(1,2,3-c,d)pyrene	4.4	4.3	3.8	ND
Naphthalene	ND	51	ND	ND
9/21/82				
Indeno(1,2,3-c,d)pyrene	9.1	3.0	ND	8.0

STEAM DISTILLATION

Steam distillation was used to detect low molecular weight alcohols, aldehydes, ketones, and nitriles in water. These compounds are too polar to be detected by VOA or CLS procedures at low levels. Therefore, a steam distillation technique was used to concentrate these compounds sufficiently for detection by GC/MS (Chian, 1977; Peters, 1980; Ramstad, 1982). Eleven standard compounds were carried through the procedure for direct quantitation and are listed below. However the GC/MS was operated in the full scan mode so other compounds which appeared in the distillates could be tentatively identified and assigned an approximate concentration.

Ethanol
Acrylonitrile
Acetone
2-Methylpropanenitrile
Butanal
2-Methyl-2-butanol
Propanenitrile
2-Butanone
1-Pentanol
Heptanol
1-Hexanol

PROCEDURE

Steam distillation grab samples were collected in 2 L amber glass bottles with teflon-lined caps. The samples were preserved with sodium thiosulfate and mercuric chloride and kept at 4°C until analysis. One liter of the sample was poured into a two liter round bottom flask, 40 gm of sodium sulfate added and the flask fitted into the distillation apparatus. The flask was heated and distillate collected in a 15 ml pear flask cooled with ice. The distillate was then stored at 4°C until GC/MS analysis. In addition to the samples, a distillation blank and a 10 µg/L standard were distilled. The samples, standards and blanks were analyzed as per the normal VOA procedure with the following exceptions. Only 5 ml of sample was purged, the sample was saturated with sodium sulfate prior to the purging, and the sample was heated to 50°C. The salt addition and the heating were done to increase the recovery of the compounds. The samples were quantitated using the external standard method.

PRECISION

The results of precision tests for specifying the IDL and the MDL are shown below.

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Compound	IDL (µg/L)	MDL (µg/L)
Ethanol	0.5	1.0
Acrylonitrile	0.1	0.21
Acetone	0.5	1.6
2-Methylpropanenitrile	0.01	0.27
Butanal	0.01	0.30
2-Methyl-2-butanol	0.01	0.48
Propanenitrile	0.01	0.27
2-Butanone	0.1	1.3
1-Pentanol	0.01	0.56
Heptanol	0.01	0.11
1-Hexanol	0.01	0.36

RESULTS

Twelve samples were analyzed by steam distillation, six sites on two different days. The sites analyzed were the EEWTP blended influent, final carbon column effluent, EEWTP finished water, and the three local WTPs. Many compounds were identified at all of the sites. From the data generated by the limited number of samples which were collected, it is difficult to assess the EEWTP performance. However, it does not appear that the number and concentration of compounds in the EEWTP finished water are considerably less than the other WTPs. The steam distillation results are listed below.

Additional Organics Analytical Program

EEWTP SITES (μg/L)

Compound/Date	Blended Influent	Final Carbon Column Effluent	Finished
8/23/82			
Acetonitrile	0.8	ND	0.1
Ethanol	0.9	0.1	0.1
2-Propenal	(0.09)[2]	ND	ND
Acrylonitrile	0.09	0.03	ND
2-Methylpropanenitrile	ND	0.5	0.4
Butanal	0.1	0.03	0.07
2-Methyl-2-butanol	0.03	ND	ND
2-Butanone	0.2	ND	ND
Oxiranemethanol	(0.8)	ND	ND
1,1'-Oxybisethane	(0.09)	ND	ND
Ethenylacetate	(0.5)	ND	ND
Tetrahydrofuran	(0.8)	(0.5)	(0.4)
Pentanal	(0.07)	ND	ND
Methylbutanone isomers	(0.2)	ND	ND
Cyclopentanol	(0.15)	ND	ND
2-Hexanone	(0.1)	ND	ND
Hexanal	(0.1)	(0.03)	(0.15)
4-Propylphenol	(0.05)	ND	ND
4-Octen-3-one	(0.04)	(0.04)	ND
2-Ethyl-1-hexanol	(0.02)	(0.02)	(0.02)
1-Octanol	(0.03)	(0.01)	ND
Nonanal	(0.03)	(0.04)	(0.09)
Decanal	ND	(0.02)	ND
2-Propanone	ND	ND	(0.7)
6-Methyl-2-heptanone	ND	ND	(0.01)
3-(1-Methylethyl)oxetane	ND	ND	(0.05)
Azulene	(0.02)	ND	(0.02)
2-Butenal	(0.02)	ND	ND
2-Methylbutanal	(0.04)	ND	ND
2-Methylpentanal	(0.02)	ND	ND
2,3-Dimethyl-2-butanol	(0.03)	ND	ND
6-Methyl-5-hepten-2-one	(0.02)	ND	ND
(1-Methyl-4-(1-methyl-ethyl)-7-oxabicyclo-/2.2.1/heptane	(0.01)	ND	ND
1,7,7-Trimethylbicyclo-/2.2.1/heptan-2-one	(0.03)	ND	ND
2-Methyl-5-(1-methylethenyl)-2-cyclohexen-1-one	(0.01)	ND	ND
4-Methyl-1-(1-methylethyl)-3-cyclohexen-1-ol	ND	ND	(0.01)
Undecanal	ND	ND	(0.03)

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EEWTP SITES (μg/L)

Compound/Date	Blended Influent	Final Carbon Column Effluent	Finished
8/31/82			
Acrylonitrile	ND	0.04	ND
Butanal	0.08	ND	ND
2-Methyl-2-butanol	0.02	ND	0.03
Propanenitrile	ND	ND	0.02
2-Butanone	ND	ND	0.16
Heptanal	ND	ND	0.04
1-Hexanol	0.01	ND	ND
2,4-Dimethyl-3-pentanol	(9.6)	ND	ND
Pentanal	(0.07)	ND	ND
2,3-Dimethyl-2-butanol	(0.03)	ND	ND
Hexanal	(0.07)	(0.09)	(0.06)
2,2,4-Trimethyloxepane	(0.03)	ND	ND
2-Heptanone	(0.05)	(0.03)	ND
Pentafluoro/(pentafluoro-phenoxy)methylbenzene	(0.03)	ND	ND
2-Ethyl-1-hexanol	(0.03)	(0.06)	(0.02)
Nonanal	(0.05)	(0.05)	(0.04)
1-(4-Hydroxyphenyl)-ethanone	(0.02)	ND	ND
Decanal	(0.04)	(0.03)	ND
Dichloromethoxybenzene	(0.02)	ND	ND
2-Butene	ND	(4.4)	(1.8)
Methyloxirane	ND	(3.8)	(2.7)
2-Methoxy-2-methylpropane	ND	(6.0)	ND
1-Ethoxy-2-methylpropane	ND	(0.2)	ND
Tetrahydrofuran	ND	(0.7)	(0.5)
3-(1-Methylethyl)oxetane	ND	(0.04)	(0.03)
3,3-Dimethylhexanal	ND	(0.04)	(0.05)
1-Octanol	ND	(0.03)	(0.02)

FINISHED WATERS (μg/L)

Compound/Date	EEWTP	WTP1	WTP2	WTP3
8/23/82				
Acetonitrile	0.1	2.1	1.5	1.9
Ethanol	0.2	0.2	ND	ND
2-Propenal	ND	(0.09)	(0.06)	(0.08)
Acrylonitrile	ND	0.2	0.09	0.3
2-Methylpropanenitrile	0.4	UTD[3]	0.2	0.2
Butanal	0.07	0.1	0.2	0.09
2-Methyl-2-butanol	ND	0.02	0.03	0.02
Propanenitrile	ND	0.09	0.05	0.06
2-Butanone	ND	0.9	ND	0.3
Tetrahydrofuran	(0.4)	(2.4)	(0.2)	ND
Pentanal	ND	(1.0)	(0.8)	(0.6)
2-Hexanone	ND	(0.07)	(0.1)	ND
Hexanal	(0.15)	ND	(0.1)	(0.1)
2-Ethyl-1-hexanol	(0.02)	(0.07)	ND	ND
1-Octanol	ND	(0.02)	(0.03)	(0.03)
Nonanal	(0.09)	(0.04)	(0.04)	(0.03)
Decanal	ND	(0.04)	ND	ND
2-Propanone	(0.7)	ND	ND	ND
6-Methyl-2-heptanone	(0.01)	(0.02)	(0.01)	ND
3-(1-Methylethyl)oxetane	(0.05)	(0.04)	(0.04)	ND
Azulene	(0.02)	(0.09)	(0.03)	(0.04)
2-Methylbutanal	ND	(0.7)	(0.4)	(0.4)
4-Methyl-1-(1-methylethyl)-3-cyclohexen-1-ol	(0.01)	(0.02)	ND	(0.02)
Undecanal	(0.03)	(0.02)	(0.03)	(0.02)
Heptanal	ND	(0.1)	(0.07)	ND
2-Methyl-2-propanone	ND	ND	(0.3)	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	(0.07)	ND	ND
2-Methylpropanal	ND	(1.1)	(0.8)	(0.7)
3-Methyl-2-butanone	ND	(0.07)	ND	(0.09)
2,3-Dimethylsuccinonitrile	ND	(0.3)	ND	(0.1)
2-Nitropropane	ND	(0.7)	(0.4)	(0.4)
Benzaldehyde	ND	(0.1)	(0.04)	(0.03)
Methyloxirane	ND	ND	(1.1)	ND
2,2-Methyloxirane	ND	ND	(0.1)	ND
2,3-Butanedione	ND	ND	(0.3)	(0.2)
1,3,5-Cycloheptatriene	ND	ND	(0.1)	(0.04)
Octanal	ND	(0.4)	(0.7)	ND
Chloroacetonitrile	ND	(0.03)	(0.03)	ND
3-Hexanone	ND	(0.02)	ND	ND
Bicyclo/4.2.0/octa-1,3,5-triene	ND	(0.08)	(0.04)	(0.1)
2,2,6-Trimethylcyclohexanone	ND	(0.02)	(0.02)	(0.02)

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FINISHED WATERS (µg/L)

Compound/Date	EEWTP	WTP1	WTP2	WTP3
2,3,3,4-Tetramethylpentane	ND	ND	ND	(0.07)
2,3-Pentanedione	ND	ND	ND	(0.2)
1,2,3-Trimethylcyclohexane	ND	ND	ND	(0.01)
3,5,5-Trimethyl-2-cyclo-hexen-1-one	ND	ND	ND	(0.01
4-Methyl-2-propyl-1-pentanol	ND	ND	ND	(0.01)
2,2,6-Trimethylbicyclo-/3.1.1/heptane	ND	ND	ND	(0.03)
2,6,6-Trimethyl-1-cyclo-hexene-1-carboxaldehyde	ND	ND	ND	(0.02)
8/31/82				
Acrylonitrile	ND	0.25	0.07	0.08
2-Methylpropanenitrile	ND	ND	0.18	0.06
Butanal	ND	0.4	0.09	0.04
2-Methyl-2-butanol	0.03	0.02	0.09	ND
Propanenitrile	0.02	0.13	0.06	0.07
2-Butanone	0.16	1.1	0.13	0.04
Tetrahydrofuran	(0.5)	ND	ND	ND
Pentanal	ND	(3.9)	(0.5)	(0.19)
2-Hexanone	ND	(0.04)	ND	ND
Hexanal	(0.06)	(0.09)	(0.04)	ND
2-Ethyl-1-hexanol	(0.02)	(0.05)	(0.04)	(0.05)
1-Octanol	(0.02)	(0.03)	(0.02)	ND
Nonanal	(0.04)	(0.06)	(0.06)	(0.03)
Decanal	ND	(0.04)	(0.04)	(0.02)
6-Methyl-2-heptanone	ND	(0.02)	ND	ND
3-(1-Methylethyl)oxetane	(0.03)	ND	ND	(0.04)
Azulene	ND	ND	(0.03)	(0.03)
2-Methylbutanal	ND	(0.5)	(0.3)	(0.12)
Heptanal	0.04	0.05	0.02	ND
2-Methylpropanal	ND	ND	ND	(0.2)
3-Methyl-2-butanone	ND	(0.15)	(0.1)	ND
2,3-Dimethylsuccinonitrile	ND	(0.24)	(0.09)	(0.04)
2-Nitropropane	ND	(0.41)	(0.37)	(0.12)
Benzaldehyde	ND	0.07	0.03	ND
Methyloxirane	2.7	ND	(2.3)	ND
1,3,5-Cycloheptatriene	ND	(0.17)	ND	ND
2,2,6-Trimethylcyclohexanone	ND	(0.03)	(0.02)	ND
2,3-Pentanedione	ND	(0.29)	ND	(0.14)
3,5,5-Trimethyl-2-cyclo-hexen-1-one	ND	(0.02)	ND	ND
2-Butene	(1.8)	ND	(3.6)	ND
3,3-Dimethylhexanal	(0.05)	ND	ND	ND
1-Pentanol	ND	ND	0.12	ND

FINISHED WATERS (μg/L)

Compound/Date	EEWTP	WTP1	WTP2	WTP3
Hexanol	ND	0.01	0.08	ND
4,4-Dimethyl-2-oxetanone	ND	(4.8)	ND	(1.9)
1,3,5,7-Cyclooctatetraene	ND	(0.05)	ND	ND
1,2,3-Trimethylbenzene	ND	(0.01)	ND	ND
3,3-Dimethylhexanal	ND	(0.06)	ND	(0.04)
Pentafluoro/(pentafluoro-phenoxy)methyl/-benzene	ND	(0.02)	(0.02)	ND
2-Methoxy-2-methylpropane	ND	ND	(7.2)	ND
1,1-Dichloro-2-propanone	ND	ND	(0.1)	ND
4-Methyl-2,3-pentanedione	ND	ND	(0.07)	ND
Butylacetate	ND	ND	(0.03)	(0.03)
6-Methyl-1-heptanol	ND	ND	ND	(0.02)

1. ND = Not Detected
2. ( ) = Values tentatively quantitated using 1-Butanol as the standard.
3. UTD = Unable to determine due to interference problems

HIGH RESOLUTION GC/MS

Several peaks occurred in chromatograms during the RWQTP, which could not be assigned even a tentative identification using the off-site lab low resolution Finnigan quadrapole mass spectrometer. Several closed-loop-stripping (CLS) extracts were submitted to two outside laboratories for accurate mass measurements, in an attempt to identify some of these unknown peaks. The effectiveness of accurate mass measurements for enhancement of compound verification has been described in the literature by several authors (Powers, 1980; Christman, 1980). Two CLS extracts were sent to each of two different laboratories. A chromatogram with several peaks marked for identification was sent with each sample. The high resolution analysis of these peaks was intended to provide exact molecular weights which could suggest structures for the unknown compounds.

Two samples were sent to Harvey Laboratories of Charlottesville, Virginia for analysis on a V.G. model 707HS mass spectrometer. The high resolution GC/MS work had three purposes; 1) to confirm compounds already identified, 2) to identify compounds which were tentatively assigned structures, and 3) to identify entirely unknown peaks. The results which follow list the identification which the project off-site laboratory had made, followed by the results from Harvey Laboratories.

CLS SAMPLE FROM FINAL CARBON COLUMN EFFLUENT

Off-Site Identifications	Harvey Identifications
1-Methyl-4-(1-methylethyl)-7-oxabicyclo/2.2.1/heptane	C10-H18-0 This fits satisfactorily with ID
alpha,alpha-4 Trimethyl-3-cyclohexene-1-methanol, acetate	C12-H20-02 This fits satisfactorily with ID
1,3,3-Trimethylbicyclo/2.2.1/heptan-2-one	C10-H16-0 This fits satisfactorily with ID
1-Methoxytricyclo/4.3.1.1/undecane	C12-H20-0 Library fit is good but not perfect with ID
1,7,7-Trimethylbicyclo/2.2.1/heptan-2-ol, acetate	C12-H20-02 This fits satisfactorily with ID
2,5-bis(1,1-Dimethylpropyl)-2,5-cyclohexadiene-1,4-dione	C16-H24-02 This fits satisfactoily with ID
Unknown peak	C20-H32 No good library match

CLS SAMPLE FROM POTOMAC RIVER ESTUARY (2/19/82)

Off-Site Identifications	Harvey Identifications
1-Methyl-4-(1-methylethyl)-7-oxabicyclo/2.2.1/heptane	C10-H18-0 This fits satisfactorily with ID
Unknown peak	C10-H16 Could be an acetate isomer of an earlier peak, for example, 1-Methyl-4-(1-methylethenyl) cyclohexanol, acetate
2,6,11-Trimethyldodecane	C15-H32 This fits satisfactorily with ID, however the large number of possible isomers makes it hard to confirm exact ID without GC retention data
Hexadecane	C14-H30 No good library match
Unknown peak	C16-H34 4-Methylpentadecane gives a good library match, however GC retention data needed for confirmation

CLS SAMPLE FROM POTOMAC RIVER ESTUARY (2/19/82)

Off-Site Identifications	Harvey Identifications
Unknown peak	C15-H32 No good library match
Unknown peak	C16-H34 No good library matcb
Unknown peak	C16-H21-N-0 or C11-H21-N3-03 No good library match
2,5-bis(1,1-Dimethylpropyl)-2,5-cyclohexadiene-1,4-dione	C16-H24-02 This fits satisfactorily with ID
2,6,10,14-Tetramethylheptadecane	C17-H36 n-Heptadecane gives a good library match, however GC retention data needed for confirmation

The results which follow list the off-site identification and results from the University of North Carolina.

CLS SAMPLE FROM WTP2 (9/17/82)

Off-site Identifications	University of North Carolina
Unknowns	Alkyl substitued Furans

CLS SAMPLE FROM POTOMAC RIVER ESTUARY (10/1/82)

Off-site Identifications	University of North Carolina
Unknowns	Aklyl substituted Furans

The high resolution analyses provided an extra degree of confidence to the identifications made as a part of the RWQTP. The identifications could be verified further by obtaining or synthesizing standards for the compounds in question and confirming GC retention times and mass spectra. Although the simple electron impact high resolution analyses done here did not provide unambiguous structures for the unknown peaks, it did provide molecular formulas which improved our understanding.

CATION EXCHANGE

Primary and secondary amines belong to the class of organics which are ionized in solution at ordinary pH and are not easily extracted. Recent research has shown that organic amines play an important role in a water's chlorine demand (Scully, 1983). For the AOAP, samples were analyzed using a cation exchange column followed by HPLC analysis of the extract. The procedures employed are similar in concept to those outlined in EPAs Master Analytical Scheme for organic compounds (USEPA, 1983). In general, many of

these cationic compounds are too nonvolatile or polar to be chromatographable. Therefore, the cation exchange procedure was used to overcome these difficulties. The compounds examined were:

Benzidine
Pyridine
Indole
3-Chloropyridine
Quinoline
5-Chloroindole
3,3'-Dichlorobenzidine
4-Chloroquinoline

The aromatic amines which were analyzed in this fraction are all very weak bases (cations) with pKa values less than 6.0. Three different types of resins were tested for their ability to recover the compounds listed above. The conclusion of this research was that chemically-bonded reverse-phase resin gave the best results whereas the other resins tested gave poor or no recovery of the compounds tested.

The resins which were tested are listed below:

GROUP I. CATION EXCHANGE RESIN

a. Biorad AG50W-X8
b. Sepralyte SCX
c. Bond-Elute SCX

GROUP II. CHEMICALLY BONDED NON-POLAR RESIN

a. Sepralyte C-18
b. Bond-Elute CN
c. Bond-Elute NH2

GROUP III. NON-CHEMICALLY BONDED NON-POLAR RESIN

a. Bond-Elute Si
b. Amberlite XAD-7

Each resin was tested with a variety of experimental protocols to determine percent recoveries under different conditions. For example, adjusting the pH of the eluting solvents and adjusting the pH of the water samples to optimize recoveries was attempted. Final concentrates during this investigation phase were derivitized and analyzed by GCMS or analyzed underivatized by HPLC.

The conclusion of this experimental work was that Sepralyte C-18 reverse phase resin for compound isolation followed by ion pair reverse phase HPLC analysis yielded the most satisfactory results for the compounds selected for this study.

PROCEDURE

The cation exchange samples were analyzed by passing the sample through a cation collection resin, eluting the cations from the resin, and analyzing the extract on the HPLC.

The samples were collected in 1 L amber glass bottles with teflon-lined caps. The samples were dechlorinated with sodium sulfite and acidified to pH 2 to prevent biological degradation. The samples were kept at 4°C until analysis. For extraction, the entire sample was filtered through a coarse glass fiber filter to remove the small particulates which could plug the column. The exchange columns contained 0.75 grams of Sepralyte C-18 resin. The resin had been rinsed with 70 ml of deionized water, 70 ml of pesticide grade methanol, and finally 100 ml of deionized water. One liter of each sample was passed through the column with the aid of vacuum. The flow rate through the column was approximately 5 ml/min. After the sample had passed through the column, the cations were eluted by passing 100 ml of pesticide grade methanol through the column. The methanol was collected in a 300 ml round bottom flask and concentrated to 1 ml in a rotory evaporator at 60°C. This concentrate was then analyzed by HPLC.

The sample was injected into a Varian Model 54 HPLC equipped with a Varian Micropack MCH-5 5 µm, 0.26x15cm HC-ODS C-18 reverse phase column. The HPLC conditions were as follows:

Injection Volume:	10 µl
Column Used:	5 µm, C-18 reverse phase
Column Temperature:	35°C
Column Flow Rate:	0.6 ml/min
Absorbance Detector #1 wavelength:	254 nm
Absorbance Detector #2 wavelength:	Not used
Fluorescence Detector Excitation Wavelength:	220 nm
Fluorescence Detector Emmission Wavelength:	530 nm
Solvent Program:	35% Ion-pairing buffer solution (0.005 M Sodium 1-Heptansulfonate and 0.05 M Potassium Phosphate monobasic at pH 3), 55% Methanol, and 10% Acetonitrile...isocratic

The peaks were identified by retention time. The compounds were quantified using the external standard method. A standard at 5 µg/L was extracted along with the samples and this was used for the quantitation. In addition, a water blank was extracted and run as a sample.

PRECISION

The precision data were obtained to determine the IDLs and MDLs shown below.

Compound	IDL (μg/L)	MDL (μg/L)
Benzidine	0.8	0.7
Pyridine	0.4	1.5
Indole	0.3	1.5
3-Chloropyridine	1.2	5.0
Quinoline	4.5	3.0
5-Chloroindole	2.3	2.5
3,3'-Dichlorobenzidine	2.4	2.5
4-Chloroquinoline	3.1	3.0

RESULTS

Twelve samples from six sites on two different days were analyzed by cation exchange. The sites analyzed were the EEWTP blended influent, final carbon column effluent, EEWTP finished water, and the finished waters from the three local WTPs. None of the amines, for which the analytical procedure was calibrated, were found.

ANION EXCHANGE

The anion exchange procedure was used to determine the presence of chlorinated low molecular weight organic acids, sulfonic acids, ionized phenols and similar compounds. Samples were analyzed using an anion exchange column followed by GC/MS analysis of the extract similar to the work conducted by earlier researchers (Richard, 1980; Richard, 1980; Junk, 1974). In general, many of these anionic compounds are too polar to be extractable by normal liquid-liquid extraction methods. At the onset of the AOAP it was hoped that this technique would be useful for the recovery of compounds such as trichloroacetic acid, which have been reported to be major byproducts of the chlorination of humic and fulvic acids (18). Unfortunately, the AOAP ended before recoveries for such compounds became systematic and they are not reported in this work. The following compounds were specifically run as standards throughout the anion procedure:

Benzoic Acid
4-Chlorobenzoic Acid
Benzene Sulfonic Acid
Phthalic Acid
4-Nitrophenol

PROCEDURE

The samples were collected in 1 L amber glass bottles with teflon-lined caps. The samples were dechlorinated with sodium sulfite and acidified to

pH 2 to prevent biological degradation. The samples were kept at 4°C until analysis. The anion exchange columns were made up of Biorad AG 1-X8 resin, a resin recommended by EPA in their Master Analytical Scheme. The resin had been extracted overnight with methanol in a Soxhlet extractor. Resin columns were prepared with 10 ml of wet resin and then rinsed with 100 ml of deionized water, 200 ml of 1 N NaOH in water, and finally 20 ml of 1 N formic acid. The resin was then rinsed with water until the eluant was at pH 5 to 6. One liter of each sample was passed through the column with the aid of vacuum. The flow rate through the column was approximately 2.5 ml/min. After the sample had passed through the column, the column was washed with 25 ml of blank water. The anions were eluted by the passage of 100 ml of 1 N HCl in pesticide grade methanol through the column. The methanol was collected in a 300 ml round bottom flask and concentrated to 1 ml in a rotary evaporator at 30°C. The concentrate was resuspened to 3 ml and transfered to a 15 ml test tube. Here the solvent was evaporated to dryness under a stream of nitrogen. The sample was then dissolved in 0.2 ml of 1 N HCl in methanol. Next, 1.0 ml of a previously prepared diazomethane methylation reaction mixture was added to the extract. The reaction mixture was prepared by the reaction of Diazald with potassium hydroxide followed by an ether distillation. After sitting for 30 minutes, the extract was blown down to 1.0 ml with a stream of nitrogen gas and saved in a glass vial with TFE septa. This concentrate was then analyzed on the GC/MS as soon as possible. The samples were stored at 4°C prior to analysis.

GC conditions:

Injection volume:	2 µl splitless injection
Carrier gas:	Ultrapure Helium @ 60 psi
Injector pressure:	10 psi
Split flow:	30 ml/min
Column flow:	1 ml/min
Injector temperature:	250°C
GC temperature:	80°C for 1 minute, then programmed to 275°C at 2 C/min

MS conditions:

Separator oven:	290°C
Transfer line:	290°C
Mode:	Electron impact
Emmission current:	0.5 ma
Electron energy:	70 eV
Electron multiplier:	1700 v
Dynodes:	3000 v
Ion source temperature:	300°C
Scan rate:	m/e 34-345 in 0.95 seconds with a 0.05 second hold at the bottom

The samples were quantified using the external standard method. A water blank was extracted with each set of samples. The samples were then injected

into the GC/MS along with an injection of the standard (20 ng/ul). The amount of the compounds in the sample was determined by comparision with the standard injection.

PRECISION

The IDLs and MDLs are shown below.

Compound	IDL (µg/L)	MDL (µg/L)
Benzoic Acid	10	32
4-Chlorobenzoic Acid	10	51
Benzene Sulfonic Acid	10	71
Phthalic Acid	10	35
4-Nitrophenol	10	58

RESULTS

Twelve samples taken at six sites on two different days were analyzed by cation exchange. The sites analyzed were the EEWTP blended influent, final carbon column effluent, EEWTP finished water, and the finished waters from the three local WTPs. None of the anionic organics for which the procedure was calibrated were detected at any of the sites. The two carboxylic acids found in the carbon filter effluent may be byproducts of bacterial growth. The results are presented below:

EEWTP SITES (µg/L)

Compound/Date	Blended Influent	Final Carbon Column Effluent	Finished
12/17/82			
	ND[1]	ND	ND
12/21/82			
Hexadecanoic Acid	NA[2]	8.6	ND
Octadecanoic Acid	NA	3.6	ND

FINISHED WATERS (µg/L)

Compound/Date	EEWTP	WTP1	WTP2	WTP3
12/17/82	ND	ND	ND	NA
12/21/82	ND	ND	ND	ND

1. ND = Not Detected
2. NA = Not Analyzed

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